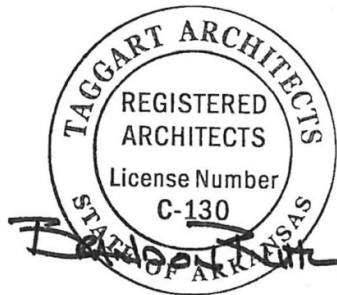


PROJECT MANUAL

Volume 1

UAMS NORTHEAST CANCER RESEARCH CLINIC JONESBORO, ARKANSAS

March 10, 2025



SEAL

MARCH 10, 2025

TAGGART
ARCHITECTS

**600 Main Street, Suite 300
North Little Rock, Arkansas 72114
Phone – (501) 758-7443
Fax - (501) 753-7309**

THE CONTRACT DOCUMENTS (DRAWINGS AND SPECIFICATIONS) ARE ISSUED AS PART OF A "SET" OF DOCUMENTS. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REVIEWING AND COORDINATING THE "WORK" OF ALL DISCIPLINES (CIVIL, ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL PLUMBING, AND FIRE PROTECTION) DURING EACH PHASE OF CONSTRUCTION AND FOR INCURING THE INCLUSION OF ALL ITEMS, SYSTEMS, AND DEVICES THAT ARE REQUIRED IN ONE PART OF THE DOCUMENTS BUT NOT INDICATED IN ALL AREAS OF THE DOCUMENTS. IF A CONFLICT OR OMISSION IS DISCOVERED, CONTACT THE ARCHITECT IMMEDIATELY FOR CLARIFICATION PRIOR TO THE START OF "WORK". GENERAL CONTRACTOR SHALL NOTE THAT NO ADDITIONAL COST WILL BE INCURRED BY THE OWNER AFTER CONSTRUCTION STARTS.

Architect's Project #170824

**UAMS NORTHEAST
CANCER RESERCH CLINIC
JONESBORO, ARKANSAS**

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(NO WORK SPECIFIED IN THIS DIVISION)

**UAMS NORTHEAST
CANCER RESERCH CLINIC
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(NO WORK SPECIFIED IN THIS DIVISION)

DOCUMENT 001116 - INVITATION TO BID

PART 1 - GENERAL

1.1 PROJECT INFORMATION

- A. Notice to Bidders: Qualified bidders are invited to submit bids for Project as described in this Document according to the Instructions to Bidders.
- B. Project Identification: University of Arkansas for Medical Sciences (UAMS) Cancer Research Clinic
- C. Project Locations: 4th Floor of the UAMS building at 311 E. Matthews, Jonesboro, Arkansas 72401
- D. Owner: University of Arkansas for Medical Sciences.
 - 1. Owner's Representative: Jonathan Davies, University of Arkansas for Medical Sciences.
- E. Architect: Taggart Architects, 600 Main Street, North Little Rock, Arkansas 72114.
- F. Project Description: Project consists of the following:
 - 1. The project is to provide the renovation of the 4th Floor of the UAMS building at 311 E. Matthews, Jonesboro, Arkansas 72401. This will provide space for a new UAMS Cancer Research Clinic that includes demolition and renovation of the entire floor. This will include, but not be limited to, new architectural components, partitions, doors, windows, hardware, millwork, ceilings, finishes, specialties, mechanical, electrical, plumbing & fire protection. In addition, a new Philips Computed Tomography (CT) (Owner Furnished – Owner Installed [OFOI] unit is to be installed which will require special accommodation to install the unit within the building, as well as new structural support of the floor, lead lined walls and doors and upgrades to the electrical and mechanical. A new Pharmacy will be installed using a company named ProPharma, which the General Contractor is to coordinate with as to the installation of the OFOI components. In addition, will be the addition of a new entrance vestibule on the 1st Floor at the existing Atrium Lobby, which will include sitework, retaining walls, drainage, concrete sidewalks, ramps, steps, curbs, and paving, as well as a new metal canopy, handrails, and automatic doors to provide handicapped access into the building to the main bank of elevators on the lower level. .
- G. Construction Contract: Bids will be received for the following Work:
 - 1. General Contract to include all trades.

1.2 BID SUBMITTAL AND OPENING

A. Owner will receive sealed bids until the bid time and date at the location indicated below. Owner will consider bids prepared in compliance with the Instructions to Bidders issued by Owner, and delivered as follows:

1. Bid Date: **Thursday, April 3, 2025.**
2. Bid Time: 3:00 p.m. (CST) local time.
3. Location: **UAMS Planning, Design & Construction
Physical Plant Building, 1st Floor, Room 400
Little Rock, Arkansas 72205**

B. Bids will be thereafter publicly opened and read aloud.

1.3 BID SECURITY

A. Bid security shall be submitted with each bid in the amount of 5 percent of the bid amount. No bids may be withdrawn for a period of 60 days after opening of bids. Owner reserves the right to reject any and all bids and to waive informalities and irregularities.

1.4 PREBID CONFERENCE

A. A prebid conference for all bidders will be held at **311 E. Matthews Avenue, Jonesboro, Arkansas on March 27, 2025 at 10:00 a.m.**, local time. Prospective bidders are **required** to attend.

1.5 PREBID QUESTIONS

A. Contractors may submit questions and clarifications via email to Taggart Architects. Please send questions to Steve Grisham sgrisham@taggarch.com. All questions and clarifications will be answered and issued as an addendum to all general contractors whom we have a record of making deposits on plans. General contractors who are not listed as plan holders will not receive addendums.

1.6 DOCUMENTS

A. Printed Procurement and Contracting Documents: Plans may be obtained from Southern Reprographics, 901 West 7th Street, Little Rock, Arkansas 72201; Phone – (501) 372-4011. Downloads are available for purchase at www.sriplanroom.com. Obtaining contract documents through any source other than the designated distribution representative is not advisable due to the risks of receiving incomplete or inaccurate information, and the bidders are at risk of basing their Bid(s) on such incomplete and inaccurate information. The documents obtained through Capitol Imaging are considered the official version and take precedence if any discrepancies occur. Bidding documents may be examined at the Architect's Office (Taggart Architects), by Appointment Only.

1. Deposit: Bidders shall pay costs to print if hard printed sets or downloads are desired.
2. Shipping: Actual Shipping Charges will be paid by the requestor prior to release of the Drawings and is not refundable.

- C. Information pertaining to Refund Policies and Procedures are contained in the “Supplementary Instructions to Bidders in this Project Manual.)

1.7 TIME OF COMPLETION AND LIQUIDATED DAMAGES

- A. Successful Bidder has Three Hundred (300) consecutive calendar days to complete the Project.
- B. There are no Liquidated Damages in this Project.

1.8 BIDDER'S QUALIFICATIONS

- A. Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work. A Performance Bond, a separate Labor and Material Payment Bond, and Insurance in a form acceptable to Owner will be required of the successful Bidder.

1.9 MINORITY PARTICIPATION

- A. Pursuant to Arkansas Code Annotated 22-9-203, the Owner encourages participation of qualified small, minority and woman owned business enterprises in the procurement of goods, services, and construction, Either as the General Contractor or subcontractor. The Owner further requests that General Contractors who require Subcontractors seek qualified small, minority, and woman owned businesses to partner with them.

1.10 COMPLIANCE WITH ARKANSAS STATUTES

- A. Bidders must comply with requirements of Contractor's Licensing Law of the State of Arkansas, and all applicable Arkansas regulations. All bonds on this project shall comply with applicable Arkansas regulations. All Contractors must be licensed the day the project bids.

1.11 WAGE RATES

- A. Arkansas Department of Labor Prevailing Wage Rates shall apply to this project.

1.12 EMPLOYMENT OF ILLEGAL IMMIGRANTS

- A. Pursuant to Act 157 of 2007, all bidders must certify prior to award of the contract that they do not employ or contract with any illegal immigrants in its contract with the State. Bidders shall certify online at: http://www.arkansas.gov/dfa/procurement/pro_index.html

1.13 OWNER'S RIGHT TO REJECT BIDS

- A. The owner reserves the right to waive any informalities or to reject any or all bids. Bidders may not withdraw their bids within 30 days after the date of bid opening and must provide bid bonds as required. All bidding processes shall be in accordance with State law.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF DOCUMENT 001116

SECTION 002113 - INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.1 INSTRUCTIONS TO BIDDERS

A. Receipt and Opening of Bids

1. University of Arkansas for Medical Sciences (herein identified as "Owner"), invites bids on the forms attached hereto, all blanks of which must be appropriately filled in.
2. The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or scheduled time for bid opening or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 30 days after the actual date of bid opening.

B. AIA Document A701, "Instructions to Bidders," is hereby incorporated into the Procurement and Contracting Requirements by reference.

1. A copy of AIA Document A701, "Instructions to Bidders," is bound in this Project Manual.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF DOCUMENT 002113

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Instructions to Bidders

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

Jonesboro Regional Program Cancer Screening and Education Renovation
Jonesboro, AR
16,000 feet of unoccupied space to allow for expand services for cancer patients in that area of our state. Preliminary program will include a computerized tomography (CT) scanner, exam rooms, and infusion.

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

University of Arkansas for Medical Sciences (UAMS)
4301 West Markham
Little Rock, AR 72205

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

Taggart Architects
600 Main Street, Suite 300
North Little Rock, AR 72114
(501) 758-7443

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- 5 CONSIDERATION OF BIDS
- 6 POST-BID INFORMATION
- 7 PERFORMANCE BOND AND PAYMENT BOND
- 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

ADDITIONS AND DELETIONS:
The author of this document may have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes 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 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.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612[™]-2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

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

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

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

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

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

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

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

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

Refer to Section 001116 - INVITATION TO BID for information pertaining to the acquisition of Bidding Documents.

§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

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

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)

All clarifications shall be submitted in writing to the Architect a minimum of 3 calendar days prior to the Bid Date. Clarifications will be answered in the form of an Addendum.

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

§ 3.3 Substitutions

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

§ 3.3.2 Substitution Process Refer to Specification Section 012500 - SUBSTITUTION PROCEDURES for the requirements for Substitutions.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

Addenda will be transmitted to all Official Plan Holders as identified by the Document Distribution Agency.

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

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

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

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

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

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

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

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

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

(Insert the form and amount of bid security.)

Bid Bond of not less than 5% of the total Bid Amount.

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

§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning 30 days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:

(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

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

with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

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

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:

(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)

If a Bid is approved to be withdrawn, the Bid Security will be returned to the Contractor.

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

§ 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

§ 6.2 Owner's Financial Capability

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable

evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 Submittals

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

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

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

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

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

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

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

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

N/A

§ 7.2 Time of Delivery and Form of Bonds

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

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

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

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

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)
None
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)
None
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)
None
- .4 Building Information Modeling Exhibit, if completed:
Not Applicable
- .5 Drawings - Refer to the Index of Drawings as published in the Project Manual, dated March 3, 2025.
- .6 Specifications - Refer to the General Index of the Project Manual, dated March 3, 2025.
- .7 Addenda: There are not Addenda issued at the time this document was prepared.
- .8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)
 - AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below: (Not Applicable)
(Insert the date of the E204-2017.)
 - The Sustainability Plan: (Not Applicable)
 - Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
Taggart Document	Supplementary General Conditions	March 3, 2025	1

.9 Other documents listed below:
(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

None



SECTION 003132 - GEOTECHNICAL REPORT COVER

PART 1 - GENERAL

1.1 DESCRIPTION

- A. General: A soils investigation report has been prepared for the site of this work by Grubbs, Hoskyn, Barton & Wyatt, Inc., Consulting Engineers, 1 Trigon Place, Little Rock, Arkansas 72209; (501) 455-2536, www.grubbsengineers.com, hereinafter referred to as the Soil Engineer or Geotechnical Engineer.
- B. Availability: The soils investigation report has been included following this Section of the Specifications.
- C. Use of Data:
 - 1. This report was obtained only for the Architect's use in design and is not part of the Contract Documents. The report is available for bidder's information but is not a warranty of subsurface conditions.
 - 2. Bidders should visit the site and acquaint themselves with all existing conditions. Prior to bidding, bidders may make their own subsurface investigations to satisfy themselves as to site and subsurface conditions, but all such investigations shall be performed only under time schedules and arrangements approved in advance by the Architect.
 - 3. Bidders shall acquaint themselves with the soils investigation pertaining to the types of soil conditions found at this site.

1.2 DESCRIPTION

- A. Test Boring Logs: The report will present physical data on subsurface conditions that is for the information of the Owner only, and in no event is this information to be considered as part of the Contract. It is expressly understood that the Owner or the Architect will not be responsible for any interpretation or conclusions drawn there from by the Contractor.
- B. Limitations of Subsurface Information Indicated on Drawings:
 - 1. Certain information regarding the reputed presence, size, character and location of existing underground structures, pipes and conduits has been indicated on the Drawings for the benefit of the Owner. There is no certainty of the accuracy of this information, and the location of underground structures indicated may be inaccurate, and other obstructions than those indicated may be encountered.
 - 2. The Contractor hereby distinctly agrees that neither the Owner nor the Architect is responsible for the correctness or sufficiency of the information given:
 - a. That in no event is this information to be considered as a part of the Contract.
 - b. That he shall have no claim for delay or extra compensation, or damage given; or on account of the insufficiency or absence of information regarding obstruction either revealed or not revealed by the Drawings; and

- c. That he shall have no claim for relief from any obligation or responsibility under the Contract, in case the location, size or character of any pipe or other underground structure is not as indicated on the Drawings, or in case any pipe or other underground structure is encountered that is not indicated on the Drawings.

1.2 SUBSURFACE INVESTIGATION

- A. Test borings were made at the site by: Grubbs, Hoskyn, Barton & Wyatt, Inc., Consulting Engineers, 1 Trigon Place, Little Rock, Arkansas 72209.
- B. Geotechnical report and boring logs will be included with the Report.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 003132

SECTION 004000 - CONTRACT FORMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes articles and forms required for the project.

1.2 TABLE OF ARTICLES AND FORMS

- A. General Conditions – AIA Document A201 – 2017, “*General Conditions of the Contract for Construction*” (Attached)
- B. Architect’s Request for Information Form, AIA Document G716 – 2004; “*Request for Information (RFI)*”, or Contractor Generated Form (AIA Document G716 attached.)
- C. Architect’s Electronic File Release Forms (Attached under Section 006520 – TAGGART / Architects – ELECTRONIC FILE RELEASE FORMS)

PART 2 - PRODUCTS

2.1 FORM DESCRIPTIONS AND REQUIREMENTS

A. AGREEMENT – GENERAL CONDITIONS

- 1. AIA, Document A201 – 2017, “*General Conditions of the Contract for Construction*” is included as an attachment to this specification and shall be the basis of the General Conditions for this project.

B. REQUEST FOR INFORMATION – RFI

- 1. When supplemental information and/or clarification of the Contract Documents are required during the construction phase, the Contractor shall request such information and/or clarification by submitting a Request for Information(RFI). Use AIA Document G716 – “*Request for Information*” or a Contractor Generated Form which provides the same information. A copy of the AIA Document is contained in this portion of the Project Manual.
- 2. Work associated with an RFI will not initiate a Change Order unless, as determine by the Architect, the work involved is significantly greater or different than the design intent in the drawings.

C. TAGGART / ARCHITECTS – ELECTRONIC FILE RELEASE FORMS

- 1. The AutoCad and Revit file request forms are included in this Project Manual under Specification Section 006520 – TAGGART / Architects – ELECTRONIC FILE RELEASE FORMS.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 004000

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AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

Jonesboro Regional Program Cancer Screening and Education Renovation
Jonesboro, AR

THE OWNER:

(Name, legal status and address)

University of Arkansas for Medical Sciences (UAMS)

4301 West Markham
Little Rock, AR 72205

THE ARCHITECT:

(Name, legal status and address)

Taggart Architects

600 Main Street, Suite 300
North Little Rock, AR 72114

TABLE OF ARTICLES

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

ADDITIONS AND DELETIONS:

The author of this document may have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes 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 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.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™–2017, Guide for Supplementary Conditions.

14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES



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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

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

§ 1.1.2 The Contract

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

§ 1.1.3 The Work

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

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

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

§ 1.1.6 The Specifications

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

§ 1.1.7 Instruments of Service

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

§ 1.1.8 Initial Decision Maker

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

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is

otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

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

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

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

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

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

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

§ 1.6 Notice

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

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

§ 1.7 Digital Data Use and Transmission

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

§ 1.8 Building Information Models Use and Reliance

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

ARTICLE 2 OWNER

§ 2.1 General

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

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

§ 2.2 Evidence of the Owner's Financial Arrangements

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

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

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

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

§ 2.3 Information and Services Required of the Owner

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

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

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the

accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

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

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

§ 2.4 Owner's Right to Stop the Work

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

§ 2.5 Owner's Right to Carry Out the Work

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

ARTICLE 3 CONTRACTOR

§ 3.1 General

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

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

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

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

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

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design

professional, unless otherwise specifically provided in the Contract Documents.

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

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

§ 3.3 Supervision and Construction Procedures

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

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

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

§ 3.4 Labor and Materials

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

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

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

§ 3.5 Warranty

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

and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

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

§ 3.6 Taxes

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

§ 3.7 Permits, Fees, Notices and Compliance with Laws

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

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

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

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

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

§ 3.8 Allowances

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not

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

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

§ 3.9 Superintendent

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

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

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

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

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

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

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

§ 3.12 Shop Drawings, Product Data and Samples

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

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

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

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

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

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

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

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

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

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

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

§ 3.13 Use of Site

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

§ 3.14 Cutting and Patching

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

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

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

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

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

§ 3.18 Indemnification

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

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

ARTICLE 4 ARCHITECT

§ 4.1 General

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

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

§ 4.2 Administration of the Contract

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

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

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

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as

required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

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

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

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

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

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

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

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

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

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

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

Contractor has made reasonable objection.

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

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

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

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

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

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

§ 6.2 Mutual Responsibility

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

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

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

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

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

§ 6.3 Owner's Right to Clean Up

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

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

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

§ 7.2 Change Orders

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

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

§ 7.3 Construction Change Directives

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

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

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

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

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

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

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

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

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

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

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

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

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

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

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

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

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

§ 8.2 Progress and Completion

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

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

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

§ 8.3 Delays and Extensions of Time

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

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

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

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

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

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

§ 9.2 Schedule of Values

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

§ 9.3 Applications for Payment

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

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

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

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

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

§ 9.4 Certificates for Payment

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

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

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

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

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

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

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

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

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

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on

account of portions of the Work done by such Subcontractor.

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

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

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

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

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

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

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

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

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

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and

insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

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

§ 9.9 Partial Occupancy or Use

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

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

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

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

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

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms,

the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

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

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

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

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

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

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

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

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

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

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

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

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall

nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;

- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings

based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.



AIA[®] Document G716[™] – 2004

Request for Information (“RFI”)

TO:

FROM:

PROJECT:

Jonesboro Regional Program Cancer Screening and Education Renovation
Jonesboro, AR

ISSUE DATE:

RFI No.:

REQUESTED REPLY DATE:

PROJECT NUMBERS:

170824

COPIES TO:

RFI DESCRIPTION: *(Fully describe the question or type of information requested.)*

REFERENCES/ATTACHMENTS: *(List specific documents researched when seeking the information requested.)*

SPECIFICATIONS:

DRAWINGS:

OTHER:

SENDER’S RECOMMENDATION: *(If RFI concerns a site or construction condition, the sender may provide a recommended solution, including cost and/or schedule considerations.)*

RECEIVER’S REPLY: *(Provide answer to RFI, including cost and/or schedule considerations.)*

By: _____

Date: _____

COPIES TO

Note: This reply is not an authorization to proceed with work involving additional cost, time or both. If any reply requires a change to the Contract Documents, a Change Order, Construction Change Directive or a Minor Change in the work must be executed in accordance with the Contract Documents.

DOCUMENT 004113 - BID FORM - STIPULATED SUM (SINGLE-PRIME CONTRACT)

PART 1 - GENERAL

1.1 BID INFORMATION

- A. Bidder: _____
- B. Project Name: University of Arkansas for Medical Sciences (UAMS) Cancer Research Clinic.
- C. Project Location: 4th Floor of the UAMS building at 311 E. Matthews, Jonesboro, Arkansas 72401.
- D. Owner: University of Arkansas for Medical Sciences.
- E. Architect: TAGGART / Architects, 600 Main Street, Suite 300, North Little Rock, Arkansas 72114..
- F. Architect Project Number: 170824

1.2 CERTIFICATIONS

- A. Base Bid, Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by TAGGART / Architects and Architect's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:
 - 1. _____ Dollars (\$ _____).(Amounts shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern.)

1.3 BID GUARANTEE

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 calendar days after a written Notice to Proceed, if offered within 60 calendar days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure constituting five percent (5%) of the Base Bid amount above.
- B. In the event Owner does not offer Notice to Proceed within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

1.4 SUBCONTRACTORS AND SUPPLIERS

A. The following companies shall execute subcontracts for the portions of the Work indicated:

- 1. Concrete Work: _____
- 2. Masonry Work: _____
- 3. Roofing Work: _____
- 4. Plumbing Work: _____
- 5. HVAC Work: _____
- 6. Electrical Work: _____

1.5 TIME OF COMPLETION

- A. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Architect, and shall fully complete the Work within **Three Hundred (300) consecutive calendar days**.
- B. A project is defined as being complete when it has been issued all certificates of occupancy by the State of Arkansas and any other Authority Having Jurisdiction (AHJ).

1.6 ACKNOWLEDGEMENT OF ADDENDA

- A. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:
 - 1. Addendum No. 1, dated _____
 - 2. Addendum No. 2, dated _____
 - 3. Addendum No. 3, dated _____
 - 4. Addendum No. 4, dated _____

1.7 BID SUPPLEMENTS

- A. The following supplements are a part of this Bid Form and are attached hereto.
 - 1. Bid Form Supplement - Alternates.
 - 2. Bid Form Supplement - Unit Prices.
 - 3. Bid Form Supplement - Bid Bond Form (AIA Document A310).

1.8 CONTRACTOR'S LICENSE

A. The undersigned further states that it is a duly licensed contractor, for the type of work proposed, in the State of Arkansas, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

1.9 CONSTRUCTION SUPERINTENDENT

A. Enclosed is the resume of the Construction Superintendent that will be placed on this job during the entire duration of construction. His/Her name is _____
_____.

1.10 SUBMISSION OF BID

A. Respectfully submitted this _____ day of _____ 2025.

B. Submitted By _____
(Name of bidding firm or corporation).

C. Authorized Signature: _____
(Handwritten signature).

D. Signed By: _____
(Type or print name).

E. Title: _____
(Owner/Partner/President/Vice President).

F. Witness By: _____
(Handwritten signature).

G. Attest: _____
(Handwritten signature).

H. By: _____
(Type or print name).

I. Title: _____
(Corporate Secretary or Assistant Secretary).

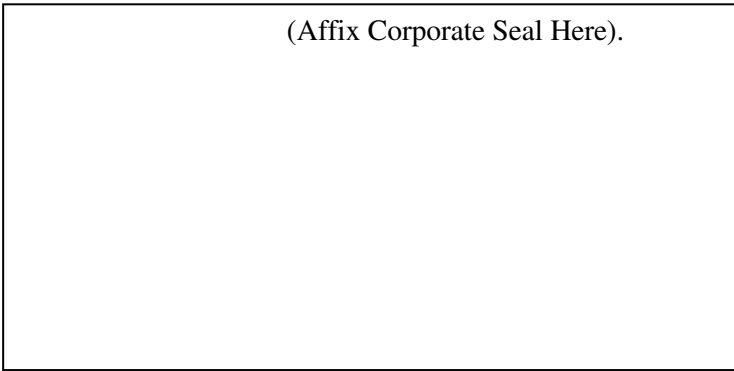
J. Street Address: _____

K. City, State, Zip _____

L. Phone: _____

M. License No.: _____

N. Federal ID No.: _____



PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF DOCUMENT 004113

DOCUMENT 004313 - BID SECURITY FORMS

PART 1 - GENERAL

1.1 BID FORM SUPPLEMENT

- A. A completed bid bond form is required to be attached to the Bid Form.

1.2 BID BOND FORM

- A. AIA Document A310, "Bid Bond," is the recommended form for a bid bond. A bid bond acceptable to Owner, or other bid security as described in the Instructions to Bidders, is required to be attached to the Bid Form as a supplement.
- B. Copies of AIA standard forms may be obtained from The American Institute of Architects; www.aia.org/contractdocs/purchase/index.htm; email: docspurchases@aia.org; (800) 942-7732.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF DOCUMENT 004313

SECTION 004321 - ALLOWANCE FORM

PART 1 - GENERAL

1.1 BID INFORMATION

- A. Bidder: _____
- B. Project Name: University of Arkansas for Medical Sciences (UAMS) Cancer Research Clinic.
- C. Project Location: 4th Floor of the UAMS building at 311 E. Matthews, Jonesboro, Arkansas 72401.
- D. Owner: University of Arkansas for Medical Sciences.
- E. Architect: TAGGART / Architects, 600 Main Street, Suite 300, North Little Rock, Arkansas 72114..
- F. Architect Project Number: 170824

1.2 BID FORM SUPPLEMENT

- A. This form is required to be attached to the Bid Form.
- B. The undersigned Bidder certifies that Base Bid submission to which this Bid Supplement is attached includes those allowances described in the Contract Documents and scheduled in Section 012100 "Allowances."

1.3 SUBMISSION OF BID SUPPLEMENT

- A. Respectfully submitted this _____ day of _____, 2024.
- B. Submitted By: _____
(Insert name of bidding firm or corporation).
- C. Authorized Signature: _____
(Handwritten signature).
- D. Signed By: _____
(Type or print name).
- E. Title: _____
(Owner/Partner/President/Vice President).

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF DOCUMENT 004321

SECTION 004393 - BID SUBMITTAL CHECKLIST

1.1 BID INFORMATION

- A. Bidder: _____
- B. Project Name: University of Arkansas for Medical Sciences (UAMS) Cancer Research Clinic.
- C. Project Location: 4th Floor of the UAMS building at 311 E. Matthews, Jonesboro, Arkansas 72401.
- D. Owner: University of Arkansas for Medical Sciences.
- E. Architect: TAGGART / Architects, 600 Main Street, Suite 300, North Little Rock, Arkansas 72114..
- F. Architect Project Number: 170824

1.2 BIDDER'S CHECKLIST

- A. In an effort to assist the Bidder in properly completing all documentation required, the following checklist is provided for the Bidder's convenience. The Bidder is solely responsible for verifying compliance with bid submittal requirements.
- B. Attach this completed checklist to the outside of the Submittal envelope.
 - 1. Used the Bid Form provided in the Project Manual.
 - 2. Prepared the Bid Form as required by the Instructions to Bidders.
 - 3. Indicated on the Bid Form the Addenda received.
 - 4. Attached to the Bid Form: Bid Supplement Form - Allowances.
 - 5. Attached to the Bid Form: Bid Bond OR a certified check for the amount required.
 - 6. Bid envelope shows name and address of the Bidder.
 - 7. Bid envelope shows the Bidder's Contractor's License Number.
 - 8. Bid envelope shows name of Project being bid.
 - 9. Bid envelope shows name of Prime Contract being bid, if applicable.
 - 10. Bid envelope shows time and day of Bid Opening.
 - 11. Verified that the Bidder can provide executed Performance Bond and Labor and Material Bond.
 - 12. Verified that the Bidder can provide Certificates of Insurance in the amounts indicated.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF DOCUMENT 004393

SECTION 006520 — TAGGART ARCHITECTS – ELECTRONIC FILE RELEASE FORMS.

PART 1 - GENERAL

1.1 SUMMARY

- A. Attached are the Electronic Release Forms utilized by TAGGART Architects for the release of electronic copies of documents in AutoCAD and Revit formats. These forms shall be utilized to request the release of documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 06520

**AUTOCAD FILE RELEASE
(Revit to AutoCAD)**

Date: _____

Contractor Name: _____

At your request, TAGGART Architects will provide electronic files for your convenience and use in the preparation of shop drawings related to the University of Arkansas for Medical Sciences (UAMS) Cancer Research Clinic, Jonesboro, Arkansas (TAGGART Architects Project #170824), subject to the following terms and conditions.

TAGGART Architects' electronic files are compatible with: AUTOCAD Release (Most Current Release). TAGGART Architects makes no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced specifications.

Data contained on these electronic files is part of TAGGART Architects' instruments of service and shall not be used by you or anyone receiving this data through or from you for any purpose other than as a convenience in the preparation of shop drawings for the referenced project. Any other use or reuse by you or by others, will be at your sole risk and without liability or legal exposure to TAGGART Architects. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against TAGGART Architects, its officers, directors, employees, agents or subconsultants which may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold harmless TAGGART Architects from all claims, damages, losses and expenses, including attorney's fees arising out of or resulting from your use of these electronic files.

These electronic files are not contract documents. Significant differences may exist between these electronic files and corresponding hard copy contract documents due to addenda, change orders or other revisions. TAGGART Architects makes no presentation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed contract documents prepared by TAGGART Architects and electronic files, the signed contract documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including and without limitations, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

Because of the potential that the information presented on the electronic files can be modified, unintentionally or otherwise, TAGGART Architects reserves the right to remove all indication of its ownership and/or involvement from each electronic display.

TAGGART Architects will furnish you electronic files of the following drawing sheets from Revit project to AutoCAD Drawings at a cost of \$75.00 per sheet, total of \$_____, check payable to TAGGART Architects. This fee is based upon receiving payment in full prior to delivery of requested files. If a purchase order is necessary, this purchase order is required to state the amount, as well as, the specific items requested prior to release.

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by TAGGART Architects and TAGGART Architects makes no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall TAGGART Architects be liable for any loss of profit or any consequential damages.

TAGGART Architects / Date

Contractor Name / Date

Revit FILE RELEASE

Date: _____

Contractor Name: _____

At your request, TAGGART Architects Architecture will provide an electronic Revit Model for your convenience related to the University of Arkansas for Medical Sciences (UAMS) Cancer Research Clinic, Jonesboro, Arkansas (TAGGART Architects Project #170824), subject to the following terms and conditions.

TAGGART Architects electronic Revit (.rvt) files are compatible with latest Autodesk Release: Revit Architecture 2017. TAGGART Architects makes no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced specifications.

These electronic Revit files are not contract documents. Significant differences may exist between these electronic files and corresponding hard copy contract documents due to addenda, change orders or other revisions. TAGGART Architects makes no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed contract documents prepared by TAGGART Architects and electronic files, the signed contract documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including and without limitations, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

In consideration of TAGGART Architects providing a copy of the Revit electronic files, the General Contractor agrees to the following:

1. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against TAGGART Architects, its officers, directors, employees, agents or sub-consultants which may arise out of or in connection with your use of the electronic Revit files.
2. You shall, to the fullest extent permitted by law, indemnify and hold harmless TAGGART Architects from all claims, damages, losses and expenses, including attorney's fees arising out of or resulting from your use of these electronic files.
3. You agree to defend, indemnify, and hold the Owner, Architect/Engineer, and Contractor harmless in connection with any defects contained in the electronic Revit files and any claims arising out of the use of the electronic Revit files.
4. You acknowledge the electronic Revit files shall not replace or supersede the record hardcopy set of the drawings and other Contract Documents ("Paper Documents"). In the event of a conflict between the Paper Documents and the electronic Revit files, the Paper Documents shall govern. The General Contractor shall be deemed to have used the Paper Documents in performing its work.

5. You agree to use the Electronic Revit Files for coordination and informational purposes and agree to make no modifications to the TAGGART Architects electronic Revit files and shall return all copies of the Electronic Files, if requested. You shall not use or attempt to use the electronic Revit files or Revit Content for any other project or any purpose other than in connection with the Project.
6. You acknowledge that the Data contained on these electronic Revit files is part of TAGGART Architects' intellectual property and shall not be used by you or anyone receiving this data through or from you for any purpose other than the collaborative effort for the referenced project. Any other use or reuse by you or by others, will be at your sole risk and without liability or legal exposure to TAGGART Architects.

Because of the potential that the information presented on the electronic files can be modified, unintentionally or otherwise, TAGGART Architects reserves the right to remove all indication of its ownership and/or involvement from each electronic display.

TAGGART Architects will furnish an electronic Revit Model for the project at a cost of \$100.00, check payable to TAGGART Architects. This fee is based upon receiving payment in full prior to delivery of the requested file. If a purchase order is necessary, this purchase order is required to state the amount, as well as the specific items requested prior to release.

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by TAGGART Architects and TAGGART Architects makes no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall TAGGART Architects be liable for any loss of profit or any consequential damages.

TAGGART Architects / Date

Contractor Name / Date

SECTION 006600 - INDEX OF DRAWINGS

PART 1 – GENERAL

1.1 DATE OF INDEX

- A. Last Revision – March 10, 2025

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 INDEX OF DRAWINGS

- A. Below is listed the index of Drawings for this Project.

COVER & LIFE SAFETY

G101	COVER SHEET
G102	INDEX OF DRAWINGS & ABBREVIATIONS

LIFE SAFETY

LS101	4TH FLOOR LIFE SAFETY PLAN
LS201	UL DESIGN DATA
LS202	UL DESIGN DATA
LS203	UL DESIGN DATA
LS204	UL DESIGN DATA
LS205	UL DESIGN DATA
LS206	UL DESIGN DATA
LS207	UL DESIGN DATA
LS208	UL DESIGN DATA

STRUCTURAL

S001	GENERAL NOTES
S101	FOUNDATION & FRAMING PLAN
S201	FOUNDATION SECTIONS
S301	4th FLOOR FRAMING PLAN
S401	FRAMING SECTIONS

ARCHITECTURAL

A001	ARCHITECTURAL SITE PLAN
A002	ENLARGED ARCHITECTURAL SITE PLAN & CANOPY RCP
A101	1ST FLOOR PLAN & EXISTING PHOTOS
A104	4TH FLOOR RENOVATION & REFLECTED CEILING PLANS
A201	BUILDING ELEVATIONS
A401	ENLARGED 4TH FLOOR PLAN
A402	MILLWORK & INTERIOR ELEVATIONS
A403	MILLWORK SECTIONS
A501	INTERIOR DETAILS
A502	ROOF DETAILS
A601	DOOR & WINDOW SCHEDULE / FINISH SCHEDULE

ARCHITECTURAL (Con't)

A602	PARTITION TYPES
A701	4TH FLOOR FINISH PLAN
AD101	4TH FLOOR EXISTING, EXISTING PHOTOS, & DEMOLITION PLAN
AD102	EXISTING PHOTOS OF DEMOLITION AREA
AD103	EXISTING PHOTOS OF DEMOLITION AREA
AD104	EXISTING PHOTOS OF DEMOLITION AREA
AD105	EXISTING PHOTOS OF DEMOLITION AREA
AR101	ARCHITECTURAL RENDERINGS

MECHANICAL

M001	SCHEDULES AND LEGEND - HVAC
M002	SCHEDULES - HVAC
M101	4TH FLOOR PLANS - HVAC DUCTWORK
M102	4TH FLOOR PLANS - HVAC PIPING
M103	ROOF PLAN
M201	DETAILS - HVAC
M202	DETAILS - HVAC
M301	CONTROLS - HVAC
M302	CONTROLS - HVAC
M303	CONTROLS - HVAC
M304	CONTROLS - HVAC
M305	CONTROLS - HVAC
M306	CONTROLS - HVAC

PLUMBING

P001	SCHEDULES, LEGEND, & GENERAL NOTES - PLUMBING
P104	4TH FLOOR PLANS - PLUMBING
P105	ROOF PLAN - PLUMBING
P201	ENLARGED FLOOR PLANS - PLUMBING
P301	DETAILS - PLUMBING
P401	RISERS - PLUMBING
P402	RISERS - PLUMBING

ELECTRICAL

E001	SCHEDULES, LEGEND, DETAILS & GENERAL NOTES - ELECTRICAL
E101	1st FLOOR PLAN - ELECTRICAL
E204	4TH FLOOR PLAN - LIGHTING
E304	4TH FLOOR PLANS - POWER
E404	4TH FLOOR PLANS - SYSTEMS
E504	4TH FLOOR PLANS - MECHANICAL POWER
E505	ROOF PLAN - MECHANICAL POWER
E601	ENLARGED FLOOR PLANS - ELECTRICAL
E701	PANEL SCHEDULES & RISER DIAGRAMS - ELECTRI

FIRE PROTECTION

FP001	GENERAL NOTES & DETAILS - FIRE PROTECTION
FP104	4TH FLOOR PLANS - FIRE PROTECTION

PHARMACY VENDOR

VC0.1	PROPHARMA KEY PLAN - INDEX
VC0.2	PROPHARMA MATERIAL AND SPECIFICATIONS
VC1.0	PROPHARMA FLOOR PLAN
VC1.1	PROPHARMA DIMENSION CONTROL PLAN
VC2.0	PROPHARMA REFLECTED CEILING PLAN
VC4.0	PROPHARMA ELEVATIONS
VC5.0	PROPHARMA DETAILS
VC5.1	PROPHARMA DETAILS
VC5.2	PROPHARMA DETAILS
VCE1.0	PROPHARMA POWER - LIGHTING PLAN
VCE1.1	PROPHARMA POWER - FAN UNITS
VCE1.2	PROPHARMA POWER PLAN
VCM1.0	PROPHARMA MECH. -AIR BALANCE PLAN

PHILIPS CT VENDOR

CT1.01	PHILIPS CT - COVER, EQUIP. LEGEND & PLAN
CT1.02	PHILIPS CT - EQUIP. PLAN, TRANSPORT & EQUIP. DETAILS
CT1.03	PHILIPS CT - EQUIP. DETAILS, SUPPORT NOTES, LEGEND, & PLAN
CT1.04	PHILIPS CT - CEILING SUPPORT PLAN & CLG. MTD. SUPPORT DETAILS
CT1.05	PHILIPS CT - ELECT. NOTES, LEGEND, PLAN & CONDUIT ROUGH-IN
CT1.06	PHILIPS CT - ELECTRICAL & MISCELLANEOUS DETAILS
CT1.07	PHILIPS CT - REMOTE SERVICES NETWORK & CHECKLIST

UAMS LOW VOLTAGE

LV101	UAMS LOW VOLTAGE RESPONSIBILITY MATRIX
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RADIATION SHIELDING

RAD1.01	PHYSICIST SHIELDING REPORT
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END OF SECTION 006600

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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 Includes:

- 1. The project is to provide the renovation of the 4th Floor of the UAMS building at 311 E. Matthews, Jonesboro, Arkansas 72401. This will provide space for a new UAMS Cancer Research Clinic that includes demolition and renovation of the entire floor. This will include, but not be limited to, new architectural components, partitions, doors, windows, hardware, millwork, ceilings, finishes, specialties, mechanical, electrical, plumbing & fire protection. In addition, a new Philips Computed Tomography (CT) (Owner Furnished – Owner Installed [OFOI] unit is to be installed which will require special accommodation to install the unit within the building, as well as new structural support of the floor, lead lined walls and doors and upgrades to the electrical and mechanical. A new Pharmacy will be installed using a company named ProPharma, which the General Contractor is to coordinate with as to the installation of the OFOI components. In addition, will be the addition of a new entrance vestibule on the 1st Floor at the existing Atrium Lobby, which will include sitework, retaining walls, drainage, concrete sidewalks, ramps, steps, curbs, and paving, as well as a new metal canopy, handrails, and automatic doors to provide handicapped access into the building to the main bank of elevators on the lower level.

- B. Architect Identification: The Contract Documents, dated March 3, 2025, were prepared for this Project by TAGGART Architects, 600 Main Street, Suite 300, North Little Rock, Arkansas 72114.

1.3 CONTRACT

- A. Project will be constructed under a general construction contract.

1.4 WORK SEQUENCE

- A. Construction activities shall be sequenced so that no materials or equipment are exposed to environmental elements that may damage the material or equipment.

1.5 WORK UNDER OTHER CONTRACTS

- A. Cooperate fully with separate contractors (if any) so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

1.6 PRODUCTS ORDERED IN ADVANCE

- A. General: Owner may have negotiated Purchase Orders with suppliers of material and equipment to be incorporated into the Work. Owner shall assign these Purchase Orders to the Contractor. Costs for receiving, handling, storage if required, and installation of material and equipment are to be included in the Contract Sum.
 - 1. Contractor's responsibilities are the same as if Contractor had negotiated Purchase Orders, including responsibility to renegotiate purchase and to execute final Purchase-Order agreements.

1.7 OWNER-FURNISHED PRODUCTS

- A. Owner will furnish office and room accessories, interior signage, and other equipment. The Work includes providing support systems to receive Owner's equipment and plumbing, mechanical, and electrical connections if necessary. See Section 114610 – OWNER FURNISHED AND INSTALLED ITEMS and Section 114620 – OWNER FURNISHED - CONTRACTOR INSTALLED ITEMS.
 - 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 Contractor's Construction Schedule.
 - 3. After delivery, Owner or Owner's Representative will inspect delivered items for damage. Contractor shall be present for and assist in Owner's inspection.
 - 4. If Owner-furnished items are damaged, defective, or missing, Owner will arrange for replacement.
 - 5. Owner will arrange for manufacturer's field services and for delivery of manufacturer's warranties to Contractor.
 - 6. 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 Contractor's Construction Schedule.
 - 7. Contractor shall review Shop Drawings, Product Data, and Samples and return them to Architect noting discrepancies or anticipated problems in use of product.
 - 8. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site.
 - 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 because of Contractor's (or subcontractor's) operations, Contractor shall repair or replace them.

1.8 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 50 division format and six-digit numbering system from MasterFormat® 2014 of the Construction Specifications Institute (CSI).

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. Consult the Table of Contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.
- 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.

1.9 CONTRACT DOCUMENTS

- A. The Drawings indicate the general arrangement and scope of the systems and shall be followed insofar as possible. If deviations from the layout are necessitated by field conditions, detailed layouts of the proposed departures shall be submitted in writing to the Architect for approval before proceeding with the Work.
- B. The Drawings are not intended to show every vertical or horizontal offset that may be necessary to complete the system or clear obstructions and/or Work of other Contractors. Contractors shall anticipate during bidding that additional offsets may be required and include same in their proposals.
- C. The Drawings, Schedules and Specifications shall be considered to be cooperative and anything appearing in the Specifications that may not be indicated on the Drawings, or vice-versa, shall be considered as part of the Contract and must be executed by the Contractor the same as though indicated by both.
- D. Measurements: Contractor shall make all his/her own measurements in the field and shall be responsible for correct fitting. Contractor shall coordinate this Work with all other branches in such a manner as to cause a minimum of conflict or delay. Contractor shall coordinate his/her Work in advance with all other trades and report immediately any difficulty, which can be anticipated.

- E. Adjustments to Work in the Field:
1. The Architect reserves the right to make minor adjustments (maximum of 10'-0") in location of switches, blocking, ductwork, conduit, drains, piping, outlets, and/or equipment at no additional charge if so directed prior to their installation, but the Contractor must give notice when installation will commence.
 2. Where the Drawings show equipment, casework, or the like, Contractors shall lay out the Work to avoid conflicts.
 3. Where offsets in piping, additional fittings, necessary drains, minor valves, traps and devices are required to complete the installation, to clear obstructions or the Work of other Contractors, or for the proper operation of the system, these shall be deemed to be included in the Contract and shall be furnished and installed complete by the Contractor at no additional charge.
 4. If sinks or other items are indicated on a plan it will be assumed that they will require all plumbing components to function properly and shall be furnished and installed complete by the Contractor at no additional charge.
- F. Clearances: All installations shall be made to maintain maximum headroom and clearance around equipment. When space and/or headroom appear inadequate, Contractor shall notify Architect prior to proceeding with the installation. No claims for additional compensation will be approved for failure on the part of the Contractor or his Subcontractor to comply with this requirement.
- G. Ownership: All Contract Documents, except the Contractor's executed set, are and remain the property of the Architect. Such Contract Documents shall not be used on other Work and those sets in usable condition shall be returned to the Architect, upon request, at the completion of or cessation of the Work or termination of the contract.

1.10 CONTRACTOR'S RESPONSIBILITIES:

- A. Construction:
1. Labor and materials.
 2. Tools, construction equipment and machinery.
 3. Temporary facilities, services and protection necessary for proper execution and completion of the Work described in Section 015000 – TEMPORARY FACILITIES AND CONTROLS.
- B. Taxes:
1. Pay legally required State and Federal Taxes.
 2. Place exemption certificate number on invoices for materials incorporated in Work.
 3. Upon completion of Work, file a notarized statement with the Owner that all purchases made under exemption certificate were entitled to be exempt.
 4. Pay legally assessed penalties for improper use of exemption certificate number.
- C. Compliance:
1. Comply with all Codes, Ordinances, Rules and Regulations, Orders, and other legal requirements of public authorities that bear on performance of Work.

2. Promptly submit written notice to Architect of observed variance of Contract Documents from legal requirements.
- D. Discipline: Enforce strict discipline and good order among employees.
1. No smoking or tobacco use is allowed on this project.
 2. No spitting on the floors, walls, or in concealed spaces is allowed.
 3. Concealed spaces are not to be used for garbage and shall be remained clear of garbage and debris.
- E. Safety: Job site safety and all current regulations pertaining thereto are the responsibility of all Contractors. Certain references to safety within the Contract Documents do not constitute specific instructions to the Contractor, but are included only to highlight certain aspects of the Project conditions. In no case shall instruction from the Owner or Architect make the Owner or Architect liable for safety violations.
1. Contractors employing non-English speaking persons shall provide a minimum of one person capable of speaking in both English and the employee's language during the entire time employee is on-site.
- F. Documentation: Prior to Final Inspection, provide all test and proof of performance data in the proper format as required by the Contract Documents. Maintain current record (as-built) documents and provide proof of documentation before monthly payment approval.
- G. Contractor's Warranty: Contractor warrants, by this acceptance of the Contract, that all Work furnished and installed will be free from any and all defects in workmanship and/or materials and that all apparatus will develop capacities and characteristics specified. That if, during a period of one year, or as otherwise specified, from date of certificate of completion and acceptance of Work, any such defects in workmanship, materials or performance appear, he will, without additional cost, remedy such defects within a reasonable time to be specified in notice from the Architect. In default thereof, Owner may have such Work done and charge cost to the Contractor.
- H. Damaged Work:
1. Construction personnel shall exercise care and shall provide whatever protective measures are required to assure that their particular portions of the Work do not damage or alter portions of the Work that have been previously installed, either partially or completely.
 2. All Work so damaged or altered shall be repaired or replaced to the satisfaction of the Architect by the party whose Work has been affected, and expense thereof shall be borne by the party who caused the damage or alteration.
 3. Water infiltration and mold control:
 - a. In the event of water or moisture infiltration, the Prime Contractor shall immediately take actions necessary to stop the infiltration at its source, remove the water or moisture and thoroughly dry any affected materials, in accordance with The Institute of Inspection, Cleaning and Restoration Certification (IICRC) S500, Standard and Reference Guide for Professional Water Damage Restoration. This action must be taken no later than 24 hours after the occurrence of the infiltration. All damaged

material shall be replaced with new material unless otherwise agreed to by the Owner and Architect in writing.

- b. If water or moisture results in the development of mold or fungal growth on an exposed or unexposed material surface, the material shall be fully replaced with new material. Attempting to eliminate or contain the mold or fungal growth by applying products to the mold, covering over the mold, or otherwise “removing” the mold from the surface is not acceptable.
- c. In the event of the occurrence of mold, the Prime Contractor shall employ the services of an Owner approved qualified environmental firm or industrial hygienist specializing in mold remediation and indoor air quality to determine the cause of the problem, recommend a program for remediation, confirm that the problem has been remediated and that the mold has been removed entirely.

4. Mold discovered on existing materials during construction: If mold or fungus growth is discovered on existing materials during construction activities, the Contractor shall:

- a. Notify the Owner and Architect immediately, and in writing, detailing the location, apparent extent and potential moisture source.
- b. Defer Work in the area of contamination until an abatement plan is formulated and implemented.
- c. Assist the Owner and Architect in creating and implementing a remediation plan. The plan shall conform to the New York City Guidelines on Assessment and Remediation of Fungi in Indoor Environments (available at <http://www.ci.nyc.ny.us/html/doh/html/epi/moldrpt1.html>).

I. Permits, Regulation, Licenses, and Inspections

- 1. Secure and pay all governmental taxes and fees and other costs for all permits and licenses as necessary for proper execution and completion of Work.
- 2. General Contractor shall obtain all Building Permits.
- 3. The Owner has filed the appropriate plan submission with the Department of Health. Contractors shall file all necessary Drawings, prepare all documents, and obtain all necessary approvals of all governmental departments and agencies having jurisdiction. Contractor shall obtain all required Certificates of Inspection for his Work and deliver same to the Architect before requesting for acceptance and final payment for the Work.
- 4. All Inspections by appropriate agencies shall be scheduled by the General Contractor.
- 5. All Work for the project must be performed in accordance with all Federal, State and Local Laws, Ordinances and Rules and Regulations relating to the Work. Where the Contract Documents exceed these requirements, the Contract Documents shall govern. In no case shall Work be installed contrary to or below the minimum legal standards.
- 6. All Federal, State and Local Laws, Ordinances, Rules, Regulations, Executive Orders, pertaining to the Work are hereby made a part of this specification, by reference, the same as if repeated herein in their entirety.

7. Contractor is responsible for scheduling all required inspections by State and Local health departments and all other Authorities Having Jurisdiction (AHJ) of this project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL PROVISIONS

- A. Contractors shall read and be thoroughly familiar with all the material contained in the Project Manual and shall ensure that their Subcontractors are also thoroughly familiar with the same.
- B. Contractors shall be aware, and shall make their Subcontractors aware, that the requirements in the sections of Division 1 pertain to all the Work and they are as binding on each section of these Specifications as if they were repeated in each section in their entirety.

3.2 INSTALLATION

- A. Workmanship: All materials and equipment shall be installed and supported in a first-class workmanlike manner by mechanics skilled in their particular assigned task or trade. If workmanship is determined to be unsatisfactory, it shall be repaired or reinstalled correctly at no additional cost.
- B. Reinstalling existing items: Where existing materials, equipment, fixtures, devices, and other items are indicated on the Contract Documents to be removed or received and reinstalled under the Contract, treat such existing items as if they were new and install them in accordance with the best accepted practices of the trades involved and with all provisions of the Contract Documents for similar new items.
- C. Accessibility:
 1. Locate all equipment that must be serviced, operated or maintained in fully accessible positions. Minor deviations from the Contract Drawings may be made to allow for better accessibility, but changes of magnitude or that involve extra cost shall not be made without prior approval. Contact Architect PRIOR to installing items where clearance is not sufficient as soon as possible.
 2. Ample space shall be allowed for removal of all parts that may require replacement or service in the future.
 3. Contractor shall extend all grease fittings to an accessible location.

3.3 TOILET FACILITIES

- A. Construction personnel shall not use new or existing building toilet facilities without approval of the Owner's designated representative. Use of new building toilet facilities is not allowed unless it has been specifically designated by the Owner for construction use. If a designated toilet facility is made available to construction personnel, it shall be kept clean at all times by Contractor's personnel.

- B. Contractor shall provide temporary toilet facilities for construction personnel as specified in Section 015000 – TEMPORARY FACILITIES AND CONTROLS.

3.4 COOPERATION AND COORDINATION

- A. General Contractor's primary superintendent shall remain on the job full-time after commencement of the work and until all discrepancies in the Work have been corrected. Changing the superintendent is not allowed without two week prior notice to the Owner and the Architect and Owner's Approval.
- B. The General Contractor shall assume full responsibility for scheduling and coordinating the Work of all Subcontractors.
- C. The General Contractor shall make monthly reports to the Owner and Architect regarding the performance of each Subcontractor.

END OF SECTION 011000

SECTION 012100 - ALLOWANCES

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 governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.
 - 2. Refer to the Schedule of Allowances at the end of this Section.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials selected by Architect under allowance shall be included as part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
 - 3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
 - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
 - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. ALLOWANCE NO. 1 – LANDSCAPING & IRRIGATION ALLOWANCE

Contractor shall allow **\$5,000 (Five-Thousand Dollars)** for new landscaping and irrigation system at the new exterior entrance.. The Owner and Architect shall assist in establishing the landscaping and irrigation system design intent. Landscaping Contractor shall prepare and include landscaping and irrigation shop drawings based on the design intent and as required for permitting purposes.

Allowance shall include total cost of work including materials, labor, installation, taxes, insurance, permit fees, overhead and profit, and delivery. Claims for extra costs associated with additional landscaping and irrigation system items will not be entertained until the entire allowance is first used.

At project close-out, credit any unused allowance amounts to the Owner by Change Order Credit.

B. ALLOWANCE NO. 2 – SIGNAGE ALLOWANCE

Contractor shall allow **\$10,000.00 (Ten-Thousand Dollars)** for new signage which shall include new exterior building signage, existing monument sign update, and new interior room identification signage for the Project.

The Architect shall furnish the Contractor information on the signage based on the Owner's requirements.

Allowance shall include all material costs, labor, installation, taxes, insurance, overhead, and profit for new signage. Claims for extra costs associated with additional signage items will not be entertained until the entire allowance is first used.

At project close-out, credit any unused allowance amounts to the Owner by Change Order Credit.

C. ALLOWANCE NO. 3 – MISCELLANEOUS STEEL ADJUSTMENT ALLOWANCE

Contractor shall allow **\$5,000.00 (Five-Thousand Dollars)** to cover any adjustments to new canopy structural steel framing as a result of fabrication changes indicated on structural steel shop drawings, any miscellaneous steel required to support existing curtain wall above new automatic door at new vestibule entrance, or any on-site changes required to new canopy structural steel framing as requested by project Structural Engineer.

Allowance shall include all material costs, labor, installation, taxes, insurance, overhead, and profit for any new structural steel items. Claims for extra costs associated with additional structural steel items will not be entertained until the entire allowance is first used.

At project close-out, credit any unused allowance amounts to the Owner by Change Order Credit.

END OF SECTION 012100

SECTION 012400 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies requirements for Project meetings including:
 - 1. Pre-Construction Conference.
 - 2. Pre-Installation Conferences.
 - 3. Progress Meetings.

1.2 CONFERENCES

- A. Pre-construction Conference: Conduct a pre-construction conference after execution of the Agreement and prior to commencement of construction activities. Review responsibilities and personnel assignments.
 - 1. Attendees: The Owner, Architect and their consultants, the Contractor and his/her superintendent, subcontractors, suppliers, manufacturers, and other concerned parties shall be represented by persons authorized to conclude matters relating to the Work.
 - 2. Agenda: Discuss significant items that could affect progress, including the tentative construction schedule, critical sequencing, submittal of shop drawings, product data, samples, use of the premises, procedures for processing Change Orders, and equipment deliveries.
- B. Pre-installation Conference: Conduct a pre-installation conference before each activity that requires coordination with other construction. The Installer and representatives of manufacturers and fabricators involved in the installation, and coordination or integration with other materials and installations that have preceded or will follow, shall attend. Advise the Architect of scheduled meeting dates.
 - 1. Review progress of other activities and preparations for the activity under consideration at each conference, including time schedules, manufacturer's recommendations, weather limitations, substrate acceptability, compatibility problems and inspection and testing requirements.
 - 2. Record significant discussions, agreements and disagreements of each conference, along with the approved schedule. Distribute the meeting record to everyone concerned, promptly, including the Owner and Architect.
 - 3. Do not proceed if the conference cannot be successfully concluded. Initiate necessary actions to resolve impediments and reconvene the conference at the earliest feasible date.

- C. Progress Meetings: Conduct progress meetings at weekly intervals. Notify the Owner and Architect of scheduled dates. Coordinate one of the meeting dates with preparation of the payment request. Owner and Architect will attend a minimum of one meeting in person per month. Other meetings may be scheduled via teleconference. General Contractor to coordinate and conduct the Teleconference.
1. Attendees: The Owner and Architect, each subcontractor, supplier or other entity concerned with progress or involved in planning, coordination or performance of future activities shall be represented by persons familiar with the Project and authorized to conclude matters relating to progress.
 2. Agenda: Review minutes of the previous progress meeting. Review significant items that could affect progress. Include topics appropriate to the current status of the Project.
 3. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 4. Review the present and future needs of each entity present, including such items as:
 - a. Time.
 - b. Sequences.
 - c. Deliveries.
 - d. Off-site fabrication problems.
 - e. Site utilization.
 - f. Temporary facilities and services.
 - g. Hazards and risks.
 - h. Quality and Work standards.
 - i. Change Orders.
 - j. Documentation of information for payment requests.
- A. Reporting: No later than 3 days after each meeting, distribute copies of minutes of the meeting to each party present and to parties who should have been present. Include a summary, in narrative form, of progress since the previous meeting.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION (not used)

END OF SECTION 012400

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 DEFINITIONS

- A. “Product” is defined to include Contractor obtained items for incorporation into the Work, regardless of whether specifically obtained for project or taken from Contractor's stock of previously purchased products. The term includes all materials that must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to any portion of the work. The term also includes all material, equipment or assemblies used to connect the Work to existing infrastructure or contiguous site conditions. The term "product" is also extended to include without negating their distinctive meaning, other terms used in Contract Documents such as "specialties," "systems," "structure," "finishes," "accessories," "furnishings," "special construction," and similar terms which are self-explanatory and/or which have recognized meanings in the construction industry.
- B. “Option” is defined as an allowable choice among acceptable products. The factors involved in making such choices are further defined in Part 2 of this Section.
- C. “Substitution” is defined as a product not identified on Drawings or in Specifications as acceptable and proposed by the Contractor, during bidding or a subsequent phase of the Work, to replace a specified product. Substitutions proposed by the Contractor and accepted by the Architect, after execution of Contract will be recorded in Bulletins and shall become part of the Work. The term "substitution" specifically excludes any changes to the Contract Documents made as a result of requests by the Owner or the Architect.
 - 1. Substitution for Cause: Substitutions made as a result of conditions that are beyond Contractor's control, including but not limited to, situations where the specified product is no longer manufactured, is unsuitable for intended use, or is unavailable due to circumstances unforeseen by the Contractor, such as a labor strike, a natural disaster, or other event that delays production, thereby affecting the project schedule. Contractor's failure to obtain the specified product in a timely manner (such as Contractor-caused submittal delay, long-lead times not being taken into consideration, or similar items) is not a justifiable reason for requesting a Substitution for Cause.
 - 2. Substitution for Convenience: Substitutions made as a result of conditions that benefit the Contractor, Owner, or both, such as lower cost in labor, material or both; quicker delivery times; or other benefits to the Owner, and meet conditions as described in paragraph 2.1.B. Unless shared savings is a part of the contract, any cost saving shall go to the Owner.

1.3 INTENT OF CONTRACT DOCUMENTS

- A. Throughout the Contract Documents, products are referred to or identified by trade name or number, manufacturer's name or number, or in some like manner. When so identified, it is intended that the named product be provided. Any product other than the product identified will be classified as a substitution.
- B. It is the further intent of the Contract Documents that all products be:
 - 1. New;
 - 2. The best of their respective kinds;
 - 3. Furnished in ample quantities to facilitate proper and timely execution of the Work; and
 - 4. Of one manufacturer for each specific purpose.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: **Substitution Requests shall not be submitted and will not be considered prior to the Bid Date. General Contractor selected will make all substitution requests once Construction is started.** 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 Substitution Request form which is most familiar to the General Contractor and contains all required information.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination 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 substitution 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 and names and addresses of Architects and Owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC Evaluation Service (ICC-ES).

- j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's 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 15 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 Architect's 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.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution will not adversely affect Contractor's construction schedule.
 - c. Requested substitution has received necessary approvals of Authorities Having Jurisdiction (AHJ).
 - d. Requested substitution is compatible with other portions of the Work.

- e. Requested substitution has been coordinated with other portions of the Work.
 - f. Requested substitution provides specified warranty.
 - g. 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: Architect will consider requests for substitution if received within 60 calendar days after commencement of the Work or the issuance of the Notice to Proceed whichever occurs later.
- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Requested substitution will not adversely affect Contractor's construction schedule.
 - e. Requested substitution has received necessary approvals of Authorities Having Jurisdiction (AHJ).
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
 - i. 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.

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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

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.

1.4 WORK CHANGE PROPOSAL REQUESTS

- A. Owner-Initiated Work Change 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 for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change. If work is underway that will be affected, notify the Architect Immediately.
 - 2. Within 7 days (but as soon as possible) 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 for labor, material, equipment and services, 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 an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Work Change Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes 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 for labor, material, equipment and services, 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 an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Comply with requirements in Section 016000 - PRODUCT REQUIREMENTS if the proposed change requires substitution of one product or system for product or system specified.

C. Work Changes Proposal Request Form: AIA® Document G709[™] - 2001

1.5 ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
1. Include installation costs in purchase amount only where indicated as part of the allowance.
 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
 3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit. Submit claims within 14 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Owner will reject claims submitted later than 14 days after such authorization.
1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA® Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: AIA® Document G714™ - 2007.
 - 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.

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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
 - 1. Correlate 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.
 - b. Submittals Schedule.
 - 2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.
- B. Format and Content: Use the 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. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Arrange the Schedule of Values in tabular form with separate rows and columns to indicate the following for each item listed:
 - a. Related Specification Section or Division. (column)
 - b. Description of the Work. (column)
 - c. Labor cost (row)

- d. Material cost (row).
- e. Change Orders (numbers) that affect value. (row)
- f. Dollar value. (column)

- 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

- 3. Provide a breakdown of the Contract Sum in accordance with the List of Items at the end of this section.
- 4. Round amounts to nearest whole dollar; total shall equal 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. Include evidence of insurance or bonded warehousing if required.
- 6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- 7. 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.
- 8. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
 - b. General Conditions will be billed proportionately to the percentage of the work that is complete throughout the construction period. At no point are the General Conditions to be greater than 15% of percent of completion.
 - c. Project Close-out Documents (Record Drawings and Operations and Maintenance manuals) shall be listed as a separate pay item with value equal to lesser of 3% of the Contract Sum or \$25,000.
- 9. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

- A. Each 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, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Forms: To be determined.
- D. 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 Contractor's Construction Schedule. Use updated schedules if revisions were made.
 - 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit 3 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.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 - 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 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 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 waivers of lien on forms, executed in a manner acceptable to Owner.
- G. 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. Contractor's Construction Schedule (preliminary if not final).
 - 4. Products list.
 - 5. Schedule of unit prices.
 - 6. Submittals Schedule (preliminary if not final).
 - 7. List of Contractor's staff assignments.
 - 8. List of Contractor's principal consultants.
 - 9. Copies of building permits.

10. Copies of authorizations and licenses from Authorities Having Jurisdiction (AHJ) for performance of the Work.
 11. Initial progress report.
 12. Certificates of insurance and insurance policies.
 13. Performance and payment bonds.
 14. Data needed to acquire Owner's insurance.
 15. Initial settlement survey and damage report if required.
- H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Final Payment Application: 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 including completion of incomplete work items and the punch list.
 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, "Contractor's Affidavit of Payments of Debits and Claims."
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707, "Consent of Surety to Final Payment."
 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, if applicable.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF PAYMENT ITEMS

- A. Payment Items include:
1. General Conditions
 2. Insurance
 3. Close-Out Documents
 4. Performance Bond
 5. Building Permits

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. Requests for Information (RFIs).
 - 4. Project Web site.
 - 5. 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 Contractor's 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 - PROJECT CLOSEOUT for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. Request for Information (RFI): 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, and telephone number 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 15 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 telephone numbers, including home, office, 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, in temporary field office, and by each temporary telephone. 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.
- 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 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 activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.

4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown 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 the coordination drawings by multiple contractors 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 the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate 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 subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures 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 (32 mm) 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 the Work is being coordinated, but not for the details of the coordination, which are Contractor's 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 changes as directed and resubmit.

10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 - SUBMITTAL PROCEDURES.

1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's 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. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's 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. RFI Forms: AIA Document G716 – 2004 – “Request for Information”.
 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's 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 Contractor's 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 Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
- 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 - 3. Architect's 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 012600 - 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.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly. 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 Architect's response was received.
- F. On receipt of Architect's 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. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 - 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.8 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. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Conduct the conference to review responsibilities and personnel assignments.
2. Attendees: Authorized representatives of Owner Architect, and their consultants; Contractor and its superintendent; major subcontractors; 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.
3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - 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. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.
 - t. Construction waste management and recycling.
 - u. Parking availability.
 - v. Office, work, and storage areas.
 - w. Equipment deliveries and priorities.
 - x. First aid.
 - y. Security.
 - z. Progress cleaning.

4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect 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. Manufacturer's 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 (AHJ).
 - 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: Distribute minutes of the meeting 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 30 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 Contractor's 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. Owner's partial occupancy requirements.
 - l. Installation of Owner's furniture, fixtures, and equipment.
 - m. Responsibility for removing temporary facilities and controls.
4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at monthly intervals.
- 1. Coordinate dates of meetings with preparation of payment requests.
 - 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, 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. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 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) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Deliveries.

- 6) Off-site fabrication.
- 7) Access.
- 8) Site utilization.
- 9) Temporary facilities and controls.
- 10) Progress cleaning.
- 11) Quality and work standards.
- 12) Status of correction of deficient items.
- 13) Field observations.
- 14) Status of RFIs.
- 15) Status of proposal requests.
- 16) Pending changes.
- 17) Status of Change Orders.
- 18) Pending claims and disputes.
- 19) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's 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.

F. Coordination Meetings: Conduct Project coordination meetings at weekly regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: Each contractor, subcontractor, supplier, 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 meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

- c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Temporary facilities and controls.
 - 10) Work hours.
 - 11) Hazards and risks.
 - 12) Progress cleaning.
 - 13) Quality and work standards.
 - 14) Change Orders.

- 3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from 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 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Submittals Schedule.
 - 3. Daily construction reports.
 - 4. Field condition reports.
- B. See Section 012900 - PAYMENT PROCEDURES for submitting the Schedule of Values.

1.2 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 activities are activities on the critical path. They 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 the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Architect.
- 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. 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.

- F. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- G. Major Area: A story of construction, a separate building, or a similar significant construction element.
- H. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.3 SUBMITTALS

- A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of subcontractor.
 - 5. Description of the Work covered.
 - 6. Scheduled date for Architect's final release or approval.
- B. Preliminary Network Diagram: Submit two opaque copies, large enough to show entire network for entire construction period. Show logic ties for activities.
- C. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
 - 1. Submit an electronic copy of schedule, using software indicated, on CD-R, and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.
- D. CPM Reports: Concurrent with CPM schedule, submit three copies of each of the following computer-generated 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 all 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 all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 - 3. Total Float Report: List of all activities sorted in ascending order of total float.
- E. Daily Construction Reports: Submit two copies at monthly intervals.
- F. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

1.4 COORDINATION

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

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 - 2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial 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. Activities: Treat each story or separate area as a separate numbered activity for each principal 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 013300 - SUBMITTAL PROCEDURES in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 - 4. Startup and Testing Time: Include not less than five (5) days for startup and testing.

5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's 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.
- C. 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. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. 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.
 5. 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.
 6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 7. 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. Building flush-out.
 - m. Startup and placement into final use and operation.

8. 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.

- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

- 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 Contract Time.

- H. 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, and equipment required to achieve compliance, and date by which recovery will be accomplished.

2.3 STARTUP CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven 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 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Preliminary Network Diagram: Submit diagram within 4 days of date established for the Notice to Proceed. Outline significant construction activities for the first 60 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 Contractor's Construction Schedule using a computerized, 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 30 days after date established for the Notice to Proceed.
 - 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, regardless of Architect's approval of the schedule.
 - 2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 3. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary 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 Contractor's activities.
 - 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.
- E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Principal 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.
- F. 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.

2.5 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. Equipment at Project site.
 3. Material deliveries.
 4. High and low temperatures and general weather conditions.
 5. Accidents.
 6. Stoppages, delays, shortages, and losses.
 7. Meter readings and similar recordings.
 8. Orders and requests of authorities having jurisdiction.
 9. Services connected and disconnected.
 10. Equipment or system tests and startups.

- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
 - 1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
 - 2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 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.
- C. 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.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

1.3 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.
 - b. Architect will reject all partial submittals.
- B. Submittals Schedule: Comply with requirements in Section 013200 - CONSTRUCTION PROGRESS DOCUMENTATION for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal.
 - 1. Initial Review: Allow fifteen (15) days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Allow fifteen (15) days for processing each resubmittal.
 - 4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

- D. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 4 by 5 inches (100 by 125 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Unique identifier, including revision number.
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Other necessary identification.
- E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
1. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.
1. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, Authorities Having Jurisdiction (AHJ), and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
1. Number of Copies: Submit three (3) copies of each submittal, unless otherwise indicated. Architect will return a minimum of one (1) copy. Mark up and retain one returned copy as a Project Record Document.
- B. 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 printed data are not suitable 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. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Manufacturer's catalog cuts.
 - e. Wiring diagrams showing factory-installed wiring.
 - f. Printed performance curves.
 - g. Operational range diagrams.
 - h. Compliance with recognized trade association standards.
 - i. Compliance with recognized testing agency standards.
- C. 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. Clearly indicate all items to be considered for this Project where more than one item is available in the information submitted.
1. Preparation: 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. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Notation of coordination requirements.
 - j. Notation of dimensions established by field measurement.
 2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).
- D. Coordination Drawings: Comply with requirements in Section 013100 - PROJECT MANAGEMENT AND COORDINATION.
- E. Samples: Prepare physical units of materials or products, including the following:
1. Comply with requirements in Section 014000 - "QUALITY REQUIREMENTS" for mockups.
 2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Submit one (1) full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
Electronic submittals of color selection is not allowed.
 3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, 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. Submit three (3) sets of Samples. Architect will retain one (1) Sample sets; remainder will be returned, if requested.
 4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated. **Attach label on unexposed side.**
 5. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
 6. 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.
- F. Product Schedule or List: Prepare a written summary indicating types of products required for the Work and their intended location.
- G. Delegated-Design Submittal: Comply with requirements in Section 014000 - QUALITY REQUIREMENTS.

- H. Submittals Schedule: Comply with requirements in Section 013200 - CONSTRUCTION PROGRESS DOCUMENTATION.
- I. Application for Payment: Comply with requirements in Section 012900 - PAYMENT PROCEDURES.
- J. Schedule of Values: Comply with requirements in Section 012900 - PAYMENT PROCEDURES.
- K. 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.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 - 1. Number of Copies: Submit two (2) copies of each submittal, unless otherwise indicated. Architect will not return copies.
 - 2. Certificates and Certifications: Provide a notarized 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.
 - 3. Test and Inspection Reports: Comply with requirements in Section 014000 - QUALITY REQUIREMENTS.
- B. Contractor's Construction Schedule: Comply with requirements in Section 013200 - CONSTRUCTION PROGRESS DOCUMENTATION.
- C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Architects and Owners, and other information specified.
- D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.
- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on American Welding Society (AWS) forms. Include names of firms and personnel certified.
- F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

- H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.
- I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- J. Compatibility Test Reports: Prepare 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.
- K. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, 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.
- L. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. 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.
- M. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to Authorities Having Jurisdiction (AHJ), that product complies with building code in effect for Project.
- N. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Section 017700 – PROJECT CLOSEOUT.
- O. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- P. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.
- Q. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections.
- R. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Submittal drawings (shop, erection or setting drawings) and schedules, required for work of various trades, shall be checked **before** submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract requirements. **These drawings and schedules shall be stamped and signed by Contractor certifying to such check and approval.**
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and that obviously have not been reviewed by the Contractor for accuracy, completeness and compliance with contract requirements. **Non-reviewed and non-stamped submittals will be returned without action.** Returned plans will have to be reviewed and corrected by the Contractor before resubmitting. No additional time will be considered if this requirement is not met.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 - 1. APPROVED
 - 2. APPROVED AS NOTED
 - 3. REVISE AND RESUBMIT
 - 4. NOT APPROVED
- C. Informational Submittals: Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

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 inspecting 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 -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner or Authorities Having Jurisdiction (AHJ) are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.
- C. References
 - 1. NIST – National Institute of Standards and Technology.
 - 2. NRTL – Nationally Recognized Testing Laboratory.
 - 3. NVLAP – National Voluntary Laboratory Accreditation Program.
 - 4. CFR – Code of Federal Regulation:
 - a. 29CFR 1910.7 – Occupational Safety and Health Administration – “Definition and Requirements for a Nationally Recognized Testing Laboratory.”

1.3 DEFINITIONS

- A. 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.
- B. 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. Services do not include contract enforcement activities performed by Architect.

- C. **Product Testing:** Tests and inspections that are performed by a Nationally Recognized Testing Laboratory (NRTL), a National Voluntary Laboratory Accreditation Program (NVLAP), or a testing agency qualified to conduct product testing and acceptable to Authorities Having Jurisdiction (AHJ), to establish product performance and compliance with specified requirements.
- D. **Source Quality-Control Testing:** Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- E. **Field Quality-Control Testing:** Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- F. **Testing Agency:** An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency, employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, 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).
- G. **Experienced:** When used with an entity or individual, "experienced" 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 (AHJ).

1.4 CONFLICTING REQUIREMENTS

- A. **Referenced Standards:** If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 ACTION SUBMITTALS

- A. **Shop Drawings:** For mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
 - 1. Indicate manufacturer and model number of individual components.
 - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Contractor's Statement of Responsibility: When required by Authorities Having Jurisdiction (AHJ), submit copy of written statement of responsibility sent to Authorities Having Jurisdiction (AHJ) before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article 1.9 of this section, 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.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time 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.
 - 2. Special inspections required by Authorities Having Jurisdiction (AHJ) and indicated on the "Statement of Special Inspections."
 - 3. Owner-performed tests and inspections indicated in the Contract Documents.
- 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 nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of Authorities Having Jurisdiction (AHJ).

1.8 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, and telephone number 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 inspecting.
 - 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. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number 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 Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number 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.
- D. Permits, Licenses, and Certificates: For Owner's records, 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.

1.9 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.
- 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, 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 (AHJ) 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 inspecting indicated, as documented according to ASTM E 329 – “Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection”; and with additional qualifications specified in individual Sections; and, where required by Authorities Having Jurisdiction (AHJ), that is acceptable to authorities.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's 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 manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction 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.
 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's 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 inspecting they are engaged to perform.
 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
 3. 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 Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by Authorities Having Jurisdiction (AHJ). Perform quality-control services required of Contractor by Authorities Having Jurisdiction (AHJ), whether specified or not.
 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these 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 inspecting will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to Authorities Having Jurisdiction (AHJ), when they so direct.
- C. Manufacturer's 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 013300 - SUBMITTAL PROCEDURES.
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's 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.

- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. 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-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 any duties of Contractor.
- G. Associated Services: Cooperate with agencies 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 inspecting. 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 inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 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. Coordinate and submit concurrently with Contractor's 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.

1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Engage a qualified testing agency to conduct special tests and inspections required by Authorities Having Jurisdiction (AHJ) as the responsibility of Owner.
- B. Special Tests and Inspections: Conducted by a qualified testing agency as required by Authorities Having Jurisdiction (AHJ), as indicated in individual Specification, and as follows:
 - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews 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 (AHJ).
 - 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 ACCEPTABLE TESTING AGENCIES

- A. Provide name of Testing Agency for Architect and Owner approval.

3.2 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 Architect's reference during normal working hours.

3.3 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections 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 Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

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.
- C. Abbreviations:
 - 1. HEPA – High Efficiency Particulate Air (filter).
 - 2. HVAC – Heating, Ventilation, and Air Conditioning.
 - 3. MERV – Minimum Efficiency Reporting Value.
 - 4. OD – Outer Diameter.

1.3 REFERENCE STANDARDS

- A. American National Standards Institute (ANSI):
 - 1. **ICC/ANSI A117.1** – Accessible and Usable Buildings and Facilities.
- B. American Society for Testing and Materials (ASTM):
 - 1. **ASTM E84** – Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 2. **ASTM E136** – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.
- C. National Fire Protection Association (NFPA):
 - 1. **NFPA 70E** – Standard for Electrical Safety in the Workplace.
 - 2. **NFPA 241** – Standard for Safeguarding Construction, Alteration, and Demolition Operations.
 - 3. **NFPA 701** – Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- D. National Electrical Contractors Association (NECA).
- E. National Electrical Manufacturers Association (NEMA).

- F. Underwriters Laboratories (UL).
- G. Environmental Protection Agency (EPA).

1.4 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 to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and Authorities Having Jurisdiction (AHJ).
- B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.

1.5 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or Authorities Having Jurisdiction (AHJ), whichever is more stringent.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and Authorities Having Jurisdiction (AHJ). Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, stucco, polished concrete, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

- E. Dust and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
1. Locations of dust-control partitions at each phase of work.
 2. HVAC system isolation schematic drawing.
 3. Location of proposed air-filtration system discharge.
 4. Waste handling procedures.
 5. Other dust-control measures.

1.6 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70E.
- B. Tests and Inspections: Arrange for Authorities Having Jurisdiction (AHJ) to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in ICC/ANSI A117.1.

1.7 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 (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails, with galvanized barbed-wire top strand.
- B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- C. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).
- D. Insulation: Un-faced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

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: 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 ten (10) individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square tack and marker boards.
 - 3. Drinking water and private toilet.
 - 4. Coffee machine and supplies.
 - 5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
 - 6. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
 - 7. One copy of all required Code Books and/or Manuals, including the International Building Code, Underwriters Laboratory, and any other Codes referenced on the Life Safety Plan Drawing Sheet under “Code Data” section.
- 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.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to Authorities Having Jurisdiction (AHJ), and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of Eight (8) at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 – PROJECT CLOSEOUT.

- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 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 011000 - 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.

3.2 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. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to private system indicated as directed by Authorities Having Jurisdiction (AHJ).
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of Authorities Having Jurisdiction (AHJ) for type, number, location, operation, and maintenance of fixtures and facilities.
- E. 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.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- G. 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 underground unless otherwise indicated.
 2. Connect temporary service to Owner's existing power source, as directed by Owner.
- H. 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.
 2. Install lighting for Project identification sign, if required.
- I. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one (1) telephone line for each field office.
1. Provide additional telephone lines for the following:
 - a. Provide a dedicated telephone line for each facsimile machine in each field office.
 2. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.
 3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.
- J. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications.

3.3 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 (9 m) of building lines that is noncombustible 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. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.
 1. Provide dust-control treatment that is nonpolluting and non-tracking. Reapply treatment as required to minimize dust.
 - C. Traffic Controls: Comply with requirements of Authorities Having Jurisdiction (AHJ).
 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
 - D. Vehicular Access and Parking: Conduct the Work so as to ensure the least possible obstruction to vehicular traffic and inconvenience to the general public and the residents in the vicinity of the Work and to ensure the protection of persons, property and natural resources. No existing road or street shall be closed to the public except with the permission of the Owner and local Authorities Having Jurisdiction (AHJ).
 - E. Dewatering Facilities and Drains: Comply with requirements of Authorities Having Jurisdiction (AHJ). Maintain Project site, excavations, and construction free of water.
 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
 - F. Waste Disposal Facilities: Comply with requirements specified in Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
 - G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of Authorities Having Jurisdiction (AHJ). Comply with progress cleaning requirements in Section 017300 - EXECUTION.
 - H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

- B. 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 011000 - SUMMARY.
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of EPA Construction General Permit or Authorities Having Jurisdiction (AHJ), whichever is more stringent.
1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- D. Storm Water Control: Comply with requirements of Authorities Having Jurisdiction (AHJ). Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rains.
- E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- F. 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 environmentally safe materials.
- G. Site Enclosure Fence: Prior to commencing earthwork, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- H. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

- I. Barricades, Warning Signs, and Lights: Comply with requirements of Authorities Having Jurisdiction (AHJ) for erecting structurally adequate barricades, including warning signs and lighting.
- J. 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 weather tight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: 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 Phase: 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, replace, or clean stored or installed material that begins to grow mold.
 - 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Additional Requirements:
 - 1. Refer to Section 011000 – SUMMARY, paragraph 1.10.H for more specific requirements concerning water infiltration and mold control.

3.6 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. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. 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 (AHJ).
 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 – PROJECT CLOSEOUT

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for selecting products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. Related Requirements:
 - 1. See Section 017700 – PROJECT CLOSEOUT for submitting warranties for contract closeout.
 - 2. See Section 012500 – SUBSTITUTION PROCEDURES for specific requirements regarding substitutions.
- C. See Divisions 2 through 28 Sections for specific requirements for warranties on products and installations specified to be warranted.
- D. Where National Standard Publications are referenced, they refer to the latest published edition as of the date of bidding, unless stated otherwise.

1.2 DEFINITIONS

- A. Products: Items purchased 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 manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's 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 through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that are equivalent or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.3 SUBMITTALS

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
 - 1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
 - 2. Completed List: Within fourteen (14) 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.
 - 3. Architect's Action: Architect will respond in writing to Contractor within seven (7) days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.
- B. Substitution Requests:
 - 1. General:
 - a. Materials, products, and equipment described in the Contract Documents establish a standard of required function and a minimum desired quality or performance level, or other minimum dimensions and capacities, to be met by any proposed substitution. Acceptability of substitutions will not be considered during bidding period.
 - b. The burden of proof of equality rests with the General Contractor (Prime Bidder) and final decision with the Architect.
 - c. The Architect will make no decisions until after award of contract.
 - d. Any proposal for substitution shall be submitted within thirty (30) days after the award of the contract. Substitutions for materials or methods as specified may only be incorporated into the work after a written order from Architect has been obtained. The offering of a substitute shall be construed as including necessary modifications to design, required appurtenances, and all new building systems, for functioning of said substitution. In no case will an article other than as specified be considered if brought on site without previous authority.
 - e. Contractor may be involved to submit items similar to certain of those specified but of different monetary value. If Architect approves such substitution and amount to be added to or deducted from the Contract agreed upon, it then shall be treated as above.

- f. Should a substitution be accepted and should the substitute material prove defective or otherwise unsatisfactory for the service intended, and within the warranty period, the Contractor shall replace this material or equipment with that originally specified, without cost to the Owner.
 2. Procedures: Refer to Section 012500 – SUBSTITUTION PROCEDURES for detailed requirements regarding substitution requests..
- C. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 - SUBMITTAL PROCEDURES. Show compliance with requirements.
- D. Proof of Compliance:
 1. When Proofs of Compliance for materials and equipment are called for in the Specifications, or requested by the Architect, such proofs of Compliance shall be furnished by the Contractor in one or more of the following ways:
 - a. Certificates of Compliance shall be Notarized statements from the manufacture certifying that the materials conform to the respective type, class or grade of the reference standards named in the Specifications. In the case of stock-labeled products of standard manufacture which have a record of satisfactory performance in similar work over a period of not less than five (5) years, the Architect may, at his option, accept a Certificate of Compliance in lieu of other forms of proof named hereinafter.
 - b. Mill Certificates shall be the manufacturer's certified mill and laboratory certificates.
 - c. Testing Laboratory Certificates shall be certifications from a testing laboratory, bureau or agency, certifying that the materials or products or equipment have been tested within a period of acceptable to the Architect; they conform to the reference Standards named in the Specifications; and give the values of each test as called in the Specifications.
 - d. Report of Actual Laboratory Tests shall be the reported results of actual tests of a material, product or equipment made by a testing laboratory, bureau, or agency approved by the Architect. The report shall state the values obtained for each reference Standard name in the Specifications and shall be submitted to the Architect in such form as approved by him.
 2. The cost of all testing of materials and equipment required to meet the requirements of this Article shall be paid for by the Contractor.
 3. If any material, or product or equipment, fails to meet the requirements of the Contract Documents, any previous approvals will be withdrawn and such material, or product or equipment, shall be subject to removal and replacement by the Contractor with material, or product or equipment, meeting the Contract requirements; or, at the discretion of the Architect, the defective materials and equipment may be permitted to remain in-place subject to proper adjustment of the Contract Sum as determined by the Architect.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
 - 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 manufacturer's 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 ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 - 5. Store products to allow for inspection and measurement of quantity or counting of units.
 - 6. Store materials in a manner that will not endanger Project structure.
 - 7. Store products that are subject to damage by the elements, under cover in a weather-tight enclosure above ground, with ventilation adequate to prevent condensation.
 - 8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 9. Protect stored products from damage.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Refer to Divisions 2 through 28 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 – PROJECT CLOSEOUT.

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that 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. Architect reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
- B. Product Selection Procedures: Procedures for product selection include the following:
1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
 - a. Substitutions may be considered.
 2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.
 - a. Substitutions may be considered.
 3. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) 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, or texture from manufacturer's product line that does not include premium items.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Architect will consider requests for substitution if received within seven (7) days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

- B. Conditions: Architect will consider Contractor's 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 noncompliance 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. Owner's 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.
 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 6. Requested substitution has received necessary approvals of Authorities Having Jurisdiction (AHJ).
 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.

2.3 COMPARABLE PRODUCTS

- A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:
1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of Architects and Owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 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. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.

- B. Related Requirements:
 - 1. Section 011000 – SUMMARY for limits on use of Project site.
 - 2. Section 017700 – PROJECT CLOSEOUT for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.2 INFORMATIONAL SUBMITTALS

- A. Certificates: Submit certificate signed by a professional engineer, licensed in the state where the Project is located, certifying that location and elevation of improvements comply with requirements.

- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

- C. Certified Surveys: Submit two copies signed by professional engineer, licensed in the state where the Project is located.

- D. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.3 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 element 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.
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
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 Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
5. Refer to Section 017329 – CUTTING AND PATCHING for additional information.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

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 sitework, investigate and verify the existence and location of underground utilities, electrical systems, 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.

- B. 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.
- C. 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 local utility and 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 (AHJ).
- 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 (RFI) 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, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a professional engineer, licensed in the state where the Project is located, to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.

4. Inform installers of lines and levels to which they must comply.
 5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 7. Close site surveys with an error of closure equal to or less than the standard established by Authorities Having Jurisdiction (AHJ).
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record 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. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with Authorities Having Jurisdiction (AHJ) for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
- C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

3.5 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.
- B. Comply with manufacturer's 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: Do not use tools or equipment that produce harmful 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 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.

3.6 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. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. 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 Installer's 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.
- H. 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.
 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.
 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.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

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 National Fire Protection Association (NFPA) 241 – “Standard for Safeguarding Construction, Alteration, and Demolition Operations” 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 (27 deg C).
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- 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.
- 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 assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 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. Manufacturer's 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 manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. See Divisions 2 through 33 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.2 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least **10** days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
 - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
 - 7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.3 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. 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.
- C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.4 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. 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.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.3 PERFORMANCE

- A. 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. 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 Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to 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 Division 31 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.
- C. 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 possible. Provide materials and comply with installation requirements specified in other Sections.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate 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 eliminate evidence of patching and refinishing.
 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.
 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.

- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Recycling nonhazardous construction waste.
 - 2. Disposing of nonhazardous construction waste.
- B. While this Project will not pursue actual LEED (Leadership in Energy and Environmental Design) Certification, Owner's goal is to incorporate as many waste management procedures as possible during construction that will allow for maximum recycling of construction materials.

1.2 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. 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 (AHJ).
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 PERFORMANCE GOALS

- A. **General**: Develop waste management plan that results in end-of-Project rates for salvage/recycling of 50 to 75 percent by weight of total waste generated by the Work.
- B. **Salvage/Recycle Goals**: Owner's goal is to salvage and recycle as much nonhazardous construction waste as possible.

1.4 SUBMITTALS

- A. **Waste Management Plan**: Submit 3 copies of plan within 30 days of date established for the Notice to Proceed.

- B. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- C. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- D. 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.
- E. 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.

1.5 QUALITY ASSURANCE

- A. Waste Management Conference: Conduct conference at Project site.

1.6 WASTE MANAGEMENT PLAN

- A. General: Develop plan consisting of waste identification and waste reduction work plan. 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 construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
 - 1. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - 2. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - 3. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement waste management plan as approved by Architect and Owner. 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 occurring at Project site.

1. Distribute waste management plan to everyone concerned within three days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- 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. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. 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 Owner.
- C. 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 they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 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.
 4. Store components off the ground and protect from the weather.
 5. Remove recyclable waste off Owner's 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.

3.4 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to Authorities Having Jurisdiction (AHJ).
1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate 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: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 017419

SECTION 017700 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 GENERAL

- A. Substantial Completion: Before requesting inspection for certification of Substantial Completion, complete the following:
1. In the Application for Payment that coincides with the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed substantially complete.
 2. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
 3. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar record information.
 4. Change-over permanent locks and transmit keys to the Owner.
 5. Complete start-up testing of systems, and instruction of the Owner's personnel. Remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
 6. Complete final clean up. Touch-up and repair and restore marred exposed finishes.
- B. Inspection Procedures: On receipt of a request for inspection, the Architect will proceed or advise the Contractor of unfulfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. The Architect will repeat inspection when requested and when assured that the Work has been substantially completed.
 2. Results of the completed inspection will form the basis of requirements for final acceptance.
 3. Repeated inspections when the building is not ready will be billed back to the Contractor and subtracted from the final pay application.
- C. Final Acceptance: Before requesting inspection for certification of final acceptance and final payment, complete the following:
1. Submit final payment request with releases.
 2. Submit a final statement, accounting for changes to the Contract Sum.
 3. Submit a copy of the final inspection list stating that each item has been completed or otherwise resolved for acceptance.
 4. Submit consent of surety to final payment.
 5. Submit evidence of continuing insurance coverage complying with insurance requirements.
- D. Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice that the Work has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.

1. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated. If Architect is called out for reinspection and building is not ready, Contractor will be billed for the visit. Funds will be deducted from final payment.
- E. Record Document Submittals: Do not use Record Documents for construction purposes; protect from loss in a secure location; provide access to Record Documents for the Architect's reference.
- F. Record Drawings: Maintain a clean, undamaged set of black line white-prints of Contract Drawings and Shop Drawings. Mark-up these drawings to show the actual installation. Mark whichever drawing is most capable of showing conditions accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date. Two copies of record drawings will be required at project close out.
1. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover.
- G. Record Specifications: Maintain one copy of the Project Manual, including addenda. Mark to show variations in actual Work performed in comparison with the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot be readily discerned later by direct observation. Note related record drawing information and Product Data.
1. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.
- H. Maintenance Manuals: Organize maintenance data into sets of manageable size. Bind in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark identification on front and spine of each binder. Include the following information:
1. Emergency instructions.
 2. Spare parts list.
 3. Copies of warranties.
 4. Wiring diagrams.
 5. Recommended "turn around" cycles.
 6. Inspection procedures.
 7. Shop Drawings and Product Data.
 8. Fixture lamping schedule.
- I. Operating and Maintenance Instructions: Arrange for the installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Include a detailed review of the following:
1. Maintenance manuals.
 2. Spare parts and materials.
 3. Tools.

4. Lubricants.
 5. Control sequences.
 6. Hazards.
 7. Warranties and bonds.
 8. Maintenance agreements and similar continuing commitments.
- J. As part of instruction for operating equipment, demonstrate the following procedures:
1. Start-up and shutdown.
 2. Emergency operations.
 3. Noise and vibration adjustments.
 4. Safety procedures.
- K. Final Cleaning: Employ experienced workers for final cleaning. Clean each surface to the condition expected in a commercial building cleaning and maintenance program. Complete the following before requesting inspection for certification of Substantial Completion:
1. Remove labels that are not permanent labels.
 2. Clean transparent materials. Remove glazing compound. Replace chipped or broken glass.
 3. Clean exposed hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
 4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 5. Clean the site of rubbish, litter and other foreign substances. Remove stains, spills and other foreign deposits.
- L. Removal of Protection: Remove temporary protection and facilities.
- M. Compliance: Comply with regulations of Authorities Having Jurisdiction (AHJ) and safety standards for cleaning. Remove waste materials from the site and dispose of in a lawful manner.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 017700

SECTION 018200 - 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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
- B. Related Sections include the following:
 - 1. Section 013100 - PROJECT MANAGEMENT AND COORDINATION for requirements for preinstruction conferences.

1.3 SUBMITTALS

- A. Instruction Program: Submit two copies of outline of instructional program for demonstration and training, including 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. At completion of training, submit one complete training manuals for Owner's use.
 - 2. Provide Owner 2 DVD of training on operation of equipment.
- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article 1.4 below to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Architects and Owners, and other information specified.
- 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.
- E. Demonstration and Training DVD: Submit two copies at end of each training module.

1.4 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. Preinstruction 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 including, but not limited to, the following:
 - 1. Inspect and discuss locations and other facilities required for instruction.
 - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 - 3. Review required content of instruction.
 - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.
- 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 has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
 - 1. Motorized doors, including automatic entrance doors.
 - 2. Lighting equipment and controls.
- 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:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.

2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project Record Documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. 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. Equipment or system break-in procedures.
 - b. Routine and normal operating instructions.
 - c. Regulation and control procedures.
 - d. Safety procedures.
 - e. Instructions on stopping.
 - f. Normal shutdown instructions.
 - g. Operating procedures for emergencies.
 - h. Special operating instructions and procedures.

5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration 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 – if any.
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.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.
- B. Set up instructional equipment at instruction location.

3.2 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 Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 2. Owner will furnish an instructor to describe Owner's operational philosophy.
 3. Owner will furnish Contractor with names and positions of participants.

- 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 Contractor, with at least seven days' advance notice.
- D. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.
- E. Demonstration and Training Videotape: 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.
- F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 018200

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SECTION 024119 - SELECTIVE DEMOLITION

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.
- B. In the event of conflict between these Specifications and Drawings, the Drawings shall govern.

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected structure, if indicated on the Drawings.
 - 2. Demolition and removal of selected site elements, if indicated on the Drawings.
- B. Related Requirements:
 - 1. Section 011000 - SUMMARY for general information regarding the Project.
 - 2. Section 017300 - EXECUTION for cutting and patching procedures.
- C. Reference Standards:
 - 1. American National Standards Institute (ANSI)/American Society of Safety Engineers (ASSE):
 - a. **ANSI/ASSE A10.6** – Safety and Health Program Requirements for Demolition Operations.
 - 2. National Fire Protection Association (NFPA):
 - a. **NFPA 241** – Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.3 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 store.
- 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.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 SUBMITTALS

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- B. 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.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.

1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. As-Built Survey identifying location of removed and capped utilities.

1.7 FIELD CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. 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.
 - 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.
- D. Storage or sale of removed items or materials on-site is not permitted.

- E. 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.

1.8 COORDINATION

- A. Arrange selective demolition schedule.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing Environmental Protection Agency (EPA) notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of Authorities Having Jurisdiction (AHJ).
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 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. Verify that hazardous materials, if found, have been remediated before proceeding with building demolition operations.
- D. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs and/or video, and templates.
 - 1. 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.

2. 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.

3.2 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. Arrange to shut off utilities with utility companies.
 2. 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.
 3. 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.

3.3 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, if applicable to Project.
 1. Provide protection to ensure safe passage of people around selective demolition area.
 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.
- 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.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated on the Drawings. 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 2 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. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 - 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 Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. 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.

- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

3.7 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 (AHJ).
 - 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. Comply with requirements specified in Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
- B. Burning: Do not burn demolished materials.

3.8 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 031000 - CONCRETE FORMWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including general and supplementary conditions and Division-1 Specification Sections, apply to work specified in this Section.

1.2 DESCRIPTION

- A. Work Included:
 - 1. Formwork for structural concrete.
 - 2. Form ties and accessories; design; construction and removal of forms, including shoring, bracing, cribbing, centering and screeds.

1.3 RELATED WORK SPECIFIED ELSEWHERE:

- A. Sections of Division 3, CONCRETE, as well as all other sections involving interface with concrete work.

1.4 QUALITY ASSURANCE

- A. Comply with the following minimum standards of American Concrete Institute (ACI):
 - 1. **ACI 347R-14** – Guide to Formwork for Concrete.
 - 2. **ACI 318-14** – Building Code Requirements for Structural Concrete and Commentary.
 - 3. **ACI 301-10** – Specifications for Structural Concrete.

1.5 SUBMITTALS

- A. Shop Drawings: Show all control and construction joint locations.

1.6 JOB CONDITIONS

- A. Design loads: Do not place, handle or store products, equipment or other materials on structure before concrete has reached its design strength, and in such a manner as to not exceed design loads. Any area damaged by construction operations must be repaired or replaced at no cost to the Owner.

PART 2 - PRODUCTS

2.1 FORM MATERIALS FOR STRUCTURAL CONCRETE

- A. Lumber: Western wood products or southern forest products grading. Common or utility grades for non-exposed surfaces. Structural or construction grades for walers, braces and supports.

- B. Plywood: The Engineered Wood Association (APAP), exterior grades, PS-I, B-B PLYFORM.

2.2 FORM MATERIALS FOR ARCHITECTURAL CONCRETE

- A. Chamfer Strips: Triangular fillet in cross section $\frac{3}{4}$ " X $\frac{3}{4}$ " measuring approximately 1-inch on beveled face. Milled from clear straight grain wood surfaced each side, or extruded vinyl type, securely fastened in place to prevent leakage.

2.3 ACCESSORIES

- A. Furnish hairpin clips, bands, clamps, braces, adjustable shoring jacks fasteners, form ties, and other components necessary to execute installation of formwork. No aluminum devices or fasteners (including nails) will be permitted.
- B. Form Ties: Non-corrosive, non-staining; minimum working strength as required by concrete sections being contained with full liquid concrete and construction loads; adjustable in length to permit complete tightening of forms and of such types as to leave no metal closer than 1-1/2-inch to the surface, spacing as required to maintain formwork and finish concrete within tolerances.
- C. Form Release: non-staining liquid which will impart a waterproof film to prevent adhesion of concrete and will not stain, cause imperfections, or leave a paint-impeding coating on the face of the concrete. When finished surface is to be painted or to receive other surface treatment, the material applied to form surfaces shall be compatible with the type of paint or surface treatment to be used.
 - 1. Form release for exposed concrete shall be nox-cretetm as manufactured by Nox-Crete Products Group, Omaha, Nebraska; www.nox-crete.com, or approved equivalent.

PART 3 - EXECUTION

3.1 DESIGN

- A. Formwork and its supports shall carry adequately all liquid concrete, workers and equipment, in absolute safety, under loads imposed during construction.
- B. Design and placement of forms: ACI 347, Chapter 2, and ACI 318, Chapter 6, Forms, embedded pipes and construction joints.
- C. Tolerances for structural concrete: ACI-347, Chapter 3 -Construction, Section 3.3.1, Class B maximum, unless otherwise indicated.

3.2 CONSTRUCTION

- A. Construct forms to slopes, lines and dimensions shown, plumb and straight and sufficiently tight to prevent leakage; securely brace and shore forms to prevent displacement and to safely support construction loads.

3.3 BUILT-IN AND EMBEDDED ITEMS

- A. Provide for installation of fastening devices required for attachment of other work. Properly locate in cooperation with other trades; secure and maintain in position before concrete is poured.
- B. Coordination: Ascertain requirements and extent, location and details of items to be embedded or built into concrete. Templates or setting diagrams shall be furnished by the various trades or manufacturers when items are to be set, embedded or blocked-out by this trade. Ensure that anchors reach adequate penetration and engage with reinforcing.

3.4 OPENINGS AND SLEEVES

- A. All mechanical and electrical piping, conduits and ductwork and other items passing through the concrete shall be sleeved and located prior to pouring concrete. Location, size and spacing of all sleeves and openings shall be as submitted and approved by the Architect. Absolutely no coring or drilling through concrete framing shall be permitted without the written approval of the Architect for each instance. In the event that additional openings are required through any hardened concrete, the Contractor shall be required to employ the services of a testing agency for the location of the steel reinforcement. Both the testing agency and method used to identify the reinforcement shall be subject to the approval of the Architect. In addition, all testing and subsequent coring or drilling shall be conducted in the presence of the testing/inspection agency. The cost of all testing shall be paid by the Contractor.

3.5 LINES AND LEVELS

- A. Check the lines and levels of the completed formwork for all exposed walls, spandrels, and other structural members, before concrete is placed. Make whatever corrections or adjustments to the formwork to correct any deviations which exceed specified tolerances allowed.

3.6 CLEANING FORMWORK

- A. Force debris to and out of clean-out panels with a jet stream of compressed air. Clean-out all debris. Hose form thoroughly with water and air-jet out any standing water when weather permits.

3.7 FORM REMOVAL

- A. Remove forms in accordance with ACI 301, Paragraph 4.5, ACI Building Code requirements for Reinforced Concrete, NO. 318, Chapter 6, Section 6.2. Removal strength of concrete for stripping shall be determined in accordance with ACI 301, Paragraph 4.7.
- B. Appearance: No steel spreaders, ties or other metal shall project from or be visible on any concrete surface.
- C. Stripping: ACI 347, Paragraphs 3.6 and 3.7, and plan approved by the Structural Engineer prior to initiating stripping as per ACI 347, Paragraph 1.5.

3.8 SHORING

- A. Leave shoring and bracing in place until concrete member will safely support its own weight, plus any loads that may be placed upon it.

3.9 INSPECTION

- A. Inspection Provisions: Do not place any concrete before the forms, the size and arrangement for reinforcing steel, and the size and location of all inserts and embedded items have been inspected. Notify the testing/inspection agency for inspection of forms and reinforcing steel 24 hours prior to placement of any concrete.

END OF SECTION 031000

SECTION 031500 - EXPANSION AND CONTRACTION JOINTS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and place all expansion joint, isolation joint, and water stop materials and associated items required as indicated on the Drawings for all cast-in-place concrete.
- B. Provide all construction joints, contraction joints (scored joints) and associated items required as indicated on the Drawings for all cast-in-place concrete.

1.2 QUALITY ASSURANCE

- A. Provide at least one person who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of materials being placed and the best methods for achieving the finished joints and who shall direct all work under this section.

1.3 SAMPLES

- A. The Contractor shall submit samples of all joint materials to the Architect and Structural Engineer for approval prior to starting the work.

PART 2 - PRODUCTS

2.1 EXPANSION JOINT MATERIALS

- A. Pre-molded expansion joint filler shall conform to one of the following:
 - 1. American Society for Testing and Materials (ASTM):
 - a. **ASTM D 1751-18** - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving & Structural Construction (Non-extruding & Resilient Bituminous Types).
 - b. **ASTM D 1752-18** - Standard Specification for Preformed Sponge Rubber, Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

2.2 ISOLATION JOINT MATERIALS

- A. Isolation joint materials shall be same as specified for expansion joints.

PART 3 - EXECUTION

3.1 GENERAL

- A. Intersection of joints should generally be 90° to each other. Joints shall be provided so that there are no concrete areas between joints or at the ends of joints that would have an angle of less than 45°.

- B. The Contractor shall provide isolation joints in floor slabs at columns, footings and walls to separate the floor slab from any connection with the building or appurtenances.
- C. The Contractor shall provide isolation joints around all floor drains in unheated buildings.
- D. The isolation joints shall be of same material as specified for expansion joints.

3.2 EXPANSION AND ISOLATION JOINTS

- A. Expansion and isolation joints shall be located as shown on the Drawings and as specified in these sections of the specifications.
- B. Expansion joints for exterior concrete flatwork shall be provided so that no concrete area between expansion joints is more than 150 square feet.
- C. Selection of expansion joint material shall be as follows:
 - 1. All expansion joint material for exterior concrete work (flatwork, curbs, walls, and other similar structures) shall be non-extruding and resilient bituminous types unless otherwise noted on the Drawings.
 - 2. All expansion joint material for interior concrete slabs for unheated areas shall be non-extruding & bituminous types unless otherwise noted on the Drawings.
 - 3. All expansion joint and isolation joint material for interior concrete slabs for heated areas shall be non-extruding and non-bituminous types unless otherwise noted on the Drawings. These joints shall be protected by sealant as specified in Section 079200 – JOINT SEALANTS.
- D. Expansion and isolation joints shall be butt type except as detailed or noted on the Drawings.

3.3 CONSTRUCTION JOINTS

- A. Joints not shown on the Drawings shall be so made and located by the Contractor's equipment and procedures so as to least impair the strength of the structure. Joint locations shall be subject to the Owner's, Architect, or Structural Engineer approval.
- B. All construction joints shall be keyed joints, unless otherwise shown or noted on the Drawings.
- C. All reinforcing steel and mesh shall be continued across construction joints not intended for expansion or contraction of the structure. Additional reinforcing, and inclined dowels shall be provided as directed by the Architect or Structural Engineer.
- D. The surface of the concrete at all joints shall be thoroughly cleaned and all laitance removed.
- E. When required or permitted, bond for butt construction joints shall be obtained by one of the following methods:
 - 1. The use of an approved adhesive.

2. The use of an approved chemical retarder which delays but does not prevent setting of the surface mortar. Retarded mortar shall be removed within 24 hours after placing to produce a rough exposed aggregate bonding surface.
3. By roughening the surface of the concrete in an approved manner which will expose the aggregate uniformly and will not leave laitance, loosened particles of the aggregate or damaged concrete at the surface.

3.4 CONTRACTION JOINTS

- A. Contraction (scored) joints may be tooled or sawed approximately equal to one-quarter (1/4) the thickness of the member. Refer to Structural Drawings for additional information.

END OF SECTION 031500

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish and install cast-in-place concrete work, complete, unless otherwise specified, including formwork, reinforcing steel, mix design, placement procedures, and finishes. Furnish reinforcing steel bars for masonry work and tie bars after they are in place.
- B. Refer to Structural Drawings, Sheet S001 – GENERAL NOTES, for additional requirements.

1.2 RELATED WORK SPECIFIED IN OTHER DIVISIONS AND SECTIONS:

- A. Furnishing of structural steel base plates, anchor bolts and other metal accessories for insertion in concrete, Section 055000 – METAL FABRICATIONS.
- B. Joint Sealants, Section 079200 – JOINT SEALANTS.
- C. Vapor Retarder for slab-on-grade, Section 072615 – UNDER SLAB VAPOR RETARDER (15-MIL).
- D. Slab Joints: Section 031500 – EXPANSION AND CONTRACTION JOINTS.

1.3 REFERENCE STANDARDS

- A. American Association of State and Highway Transportation Officials (AASHTO):
 - 1. **AASHTO M182** – Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats.
- B. American Concrete Institute (ACI):
 - 1. **ACI 117-10** – Specification for Tolerances for Concrete Construction and Materials (ACI 117-10) and Commentary (ACI 117R-10) [Reapproved 2015].
 - 2. **ACI 211** – Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
 - 3. **ACI 301** – Specifications for Structural Concrete.
 - 4. **ACI 304** – Guide for Measuring, Mixing, Transporting, and Placing Concrete.
 - 5. **ACI 305** – Guide to Hot Weather Concreting.
 - 6. **ACI 306** – Guide to Cold Weather Concreting.
 - 7. **ACI 309** – Guide for Consolidation of Concrete.
 - 8. **ACI 318** – Building Code Requirements for Structural Concrete and Commentary.
 - 9. **ACI 347** – Guide to Formwork for Concrete.
- C. American Society for Testing and Materials (ASTM):
 - 1. **ASTM A36** – Standard Specification for Carbon Structural Steel.

2. **ASTM A123** – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. **ASTM A185** – Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete (Withdrawn 2013). *[Replaced by ASTM A1064.]*
4. **ASTM A536** – Standard Specification for Ductile Iron Castings.
5. **ASTM A615** – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
6. **ASTM A1064** – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
7. **ASTM C31** – Standard Practice for Making and Curing Concrete Test Specimens in the Field.
8. **ASTM C33** – Standard Specification for Concrete Aggregates.
9. **ASTM C42** – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
10. **ASTM C94** – Standard Specification for Ready-Mixed Concrete.
11. **ASTM C143** - Standard Test Method for Slump of Hydraulic-Cement Concrete.
12. **ASTM C150** – Standard Specification for Portland Cement.
13. **ASTM C171** – Standard Specification for Sheet Materials for Curing Concrete.
14. **ASTM C173** – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
15. **ASTM C231** - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
16. **ASTM C260** – Standard Specification for Air-Entraining Admixtures for Concrete.
17. **ASTM C330** – Standard Specification for Lightweight Aggregates for Structural Concrete.
18. **ASTM C881** – Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
19. **ASTM D1751** – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
20. **ASTM D1752** – Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
21. **ASTM E1155** – Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers.

D. US Army Corps of Engineers (COE):

1. **CRD C621** – Specification for Non-Shrink Grout.

E. Concrete Steel Reinforcing Institute (CRSI).

F. American National Standards Institute (ANSI).

G. American Welding Society (AWS):

1. **AWS D1.1** – Structural Welding Code – Steel.

H. German Institute for Standardization (DIN).

1.4 SUBMITTALS:

- A. Product Data: Submit manufacturer's product data for reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, and other concrete products as requested by Architect.
- B. Shop Drawings: Submit, prior to installation, shop drawings of reinforcing steel, including bar cutting lists, typical bar bend diagrams, construction of forms including jointing, reveals, location and pattern of form tie placement, and construction joint schedule with details.
- C. Design Mix: Prior to placement of concrete, submit concrete mix designs proposed by the concrete supplier, for class of concrete, including recent test results substantiating the quality of concrete produced by each mix.
- D. Reports: Weekly reports of all compression, slump, and air content tests from the testing laboratory.
- E. Samples: Submit samples of concrete stain and sealer in color selected by Architect for approval, if specified for use.

1.5 QUALITY ASSURANCE:

- A. Codes And Standards: Comply with the provisions of the following codes, specifications and standards of America Concrete Institute (ACI) and Concrete Reinforcing Steel Institute (CRSI), except where more stringent requirements are indicated or specified, and except as accepted or directed by Architect during unusual climatic conditions.
 - 1. ACI 301 "Specifications for Structural Concrete."
 - 2. ACI 318 "Building Code Requirements for Structural Concrete."
 - 3. CRSI "Manual of Standard Practice."
- B. Local Codes and Ordinances: Wherever provisions of the 2012 Arkansas Fire Prevention Code (International Building Code 2012 (IBC)) or the local current ordinances are more stringent than the above specifications and standards, the local codes and ordinances shall govern.
- C. Concrete Testing Service: Engage a testing laboratory acceptable to Owner and Architect to perform material evaluation tests and to design concrete mixes.
 - 1. Tests, including retesting of rejected materials for installed work, shall be paid for by the Contractor. Testing requirements are specified in FIELD SAMPLING AND TESTING paragraph 3.14 of this section.

PART 2 - PRODUCTS

2.1 FORM MATERIALS:

- A. Forms For Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces.

- B. Forms For Unexposed Finish Concrete: Use plywood, lumber, metal, or other acceptable material. If lumber is used, it must be dressed on at least 2 edges and 2 sides for a tight fit.
- C. Form Coatings: Commercial formulation form coating compound with maximum VOC of 350 mg/l that will not bond with, stain, nor adversely affect concrete surfaces, will not impair subsequent treatments of concrete surfaces.
- D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1-1/2" to exposed surface.
 - 1. Provide ties that, when removed, will leave holes not larger than 1" diameter in concrete surface.

2.2 REINFORCING MATERIALS:

- A. Reinforcing Bars: ASTM A 615(S1), Grade 60, deformed billet steel bars of grades indicated on drawings, free from loose rust, scale and other coatings that may reduce bond.
- B. Mesh or Fabric Reinforcement: ASTM A 185, welded wire fabric, of sizes and types as indicated on drawings. Use flat sheets.
- C. Supports For Reinforcement: Bolsters, chairs, spacers, and other devices necessary for properly spacing, supporting, and fastening reinforcement in place.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs that are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).
 - 3. For footings, support reinforcing steel with wire, metal chairs, bolsters or other approved device; do not use bricks, rocks or stones.

2.3 CONCRETE MATERIALS:

- A. Portland Cement: ASTM C 150, Type I.
- B. Concrete Aggregates: ASTM C 33 for normal weight concrete, and ASTM C 330 for light weight concrete. Provide aggregates from a single source for exposed concrete.
 - 1. Fine Aggregate: Clean, sharp, natural or manufactured sand, free from loam, clay, lumps, or other deleterious substances.
 - 2. Coarse Aggregate: Clean, uncoated, processed, locally available aggregate, containing no clay, mud, loam or foreign matter; maximum size of 1-1/2" at foundations and 1" at slabs.
- C. Water: Clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or reinforcing.

D. Admixtures:

1. Air Entrained Admixture: ASTM C 260; compatible with other required admixtures.
2. Other Admixtures: Do not use other admixtures unless accepted by Architect; added chlorides will not be accepted.

E. Miscellaneous Materials:

1. Connectors: Provide metal connectors required for placement in cast-in-place concrete, for the attachment of structural and non-structural members.
2. Vapor Retarder: Refer to Section 072615 – UNDERSLAB VAPOR RETARDER (15-MIL).
3. Expansion Joint Filler: ASTM D 1751, non-extruding premoulded material, 1/2" thick, unless otherwise noted, composed of fiberboard impregnated with asphalt, except use ASTM D 1752, Type II, resin-bound cork for walks and other exposed areas.
4. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
5. Moisture-Retaining Cover: One of the following, complying with ASTM C 171; waterproof paper, polyethylene film, polyethylene-coated burlap.
6. Non-Shrink Grout: CRD-C 621, factory pre-mixed grout.
 - a. Non-Metallic Shrinkage-Resistant Grout: Conspec "100 Non-Shrink Grout (Non-Metallic)", Euclid "Euco N.S.", L & M "Crystex", Master Builders "Masterflow 713", W. R. Meadows "Sealtight CG-86 Grout", or approved equivalent.
7. Bonding Agent: Polyvinyl acetate or acrylic base.
 - a. Polyvinyl Acetate (Interior Only): Euclid "Euco Weld", L & M "Everweld", or approved equivalent.
 - b. Acrylic or Styrene Butadiene: Euclid "SBR Latex", L & M "Everbond", Conspec "Strongbond", Master Builders "Acryl-Set", Sonneborn "Sonocrete", or approved equivalent.
8. Epoxy Adhesive: ASTM C 881, two component materials suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit project requirements.
 - a. Conspec "Spec-Bond 100", Euclid "Euco Epoxy System #452 or #620", L & M "Epabond", Master Builders "Concresive Standard Liquid", or approved equivalent.
9. Concrete Curing Compound:
 - a. W.R. Meadows® SealTight® 1100 resin-based, water emulsion concrete curing compound, clear, VOC compliant (www.wrmeadows.com).
 - b. Or approved equivalent.

10. Concrete Curing and Sealing Compounds. Furnish and install one of the following products at interior concrete floor slabs:
 - a. BASF Group, Master Builders® Solutions, MasterKure CC1315WB, transparent, high solids, water-based, modified acrylic curing, sealing, and dustproofing compound, VOC compliant (www.master-builders-solutions.basf.us).
 - b. Euclid Chemical AQUA-CURE VOX, water-based, low odor cure and seal for concrete (www.euclidchemical.com).
 - c. Conspec “Cure & Seal.”
 - d. Laticrete International, Inc. L&M™ Dress & Seal™.
 - e. BASF Sonneborn® Kure-N-Seal™.
 - f. W.R. Meadows CS-309™-25.
 - g. Or approved equivalent.
11. Waterstop: CETCO® WATERSTOP-RX®, www.cetco.com, or approved equivalent. Install in locations as shown on structural drawings.

2.4 PROPORTIONING OF MIXES:

- A. Concrete minimum ultimate strength at 28 days: refer to Structural Drawings, Sheet S001, for additional information.
- B. Mix Designs:
 1. Prepare design mixes for each type of concrete, in accordance with ACI 301 and ACI 318.
 2. Proportion design mixes by weight for class of concrete required, complying with ACI 211.
- C. 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, as approved by Architect and Structural Engineer. Laboratory test data for revised mix design and strength results must be submitted to and approved by Architect and Structural Engineer before using in work.
- D. Provide test results from the concrete supplier for proposed design mix, to establish the following:
 1. Gross weight and yield per cu. yd of trial mixtures.
 2. Measured slump.
 3. Measured air content.
 4. Compressive strength developed at 7 days and 28 days, from not less than 3 test cylinders cast for each 7- and 28-day test, and for each design mix.
- E. Submit written reports to Architect for design mixes at least 15 calendar days prior to the start of work.

2.5 ADMIXTURES

- A. Use air-entrained admixtures in strict compliance with manufacturer's directions at all concrete exposed to weather.

2.6 SLUMP LIMITS: 4" to +/- 1".

2.7 BATCHING AND MIXING

- A. Concrete may be ready-mixed or job-mixed at the Contractor's option, in accordance with the governing building code and with the referenced ACI 318. No hand mixing allowed.

- B. Job-Site Mixing:

- 1. Mix materials for concrete in appropriate drum-type batch machine mixer. For mixers of one cu. yd. or smaller capacity, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released. For mixers of capacity larger than one cu. yd., increase minimum 1-1/2 minutes of mixing time by 15 seconds for each additional cu. yd. or fraction thereof.
- 2. Provide batch ticket for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.

- C. Ready-Mix Concrete:

- 1. Comply with requirements of ASTM C 94, and as specified.
- 2. When air temperature is between 85°F and 90°F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90°F, reduce mixing and delivery time to 60 minutes.

2.8 TRENCH DRAIN

- A. Furnish and install trench drain assembly in new concrete sidewalk location as shown on the Drawings.

- B. Basis of Design

- 1. Manufacturer: Zurn Industries, LLC, 1801 Pittsburgh Avenue, Erie, PA 16514, Ph: (814) 455-0921; Fax: (814) 454-7929; Web: www.zurn.com .
- 2. Product: Zurn Z712-HDG Frame and P12-GHPD Grate System, frame and grate with galvanized finish. Grate system shall have the following features:

- a. Frames:

- (1) Model No. Z712-HDG.
- (2) Dimensions: 10 ft. long x 12-inches wide reveal with an 8-1/2-inch clear opening.
- (3) Frame shall lock into concrete surround every 12-inches.

- (4) ¼-inch (0.25-inch) thick galvanized carbon steel frame assembly conforming to ASTM A36 with galvanizing conforming to ASTM A123 with twelve (12) 4-inch long concrete anchors per 10 ft. long section.
- (5) Grate lockdown bars are integral to frame. All welds, if required, must be performed by a certified welder per AWS D1.1.
- (6) Frames shall be produced in the USA.

b. Grates:

- (1) Model ID: P12-GHPD – Galvanized Ductile Iron Heel-Proof Longitudinal Grate.
- (2) Part No: 61015.
- (3) Dimensions: 11-1/4-inch wide x 24-inches long x 1-7/16-inch depth.
- (4) Weight: 14-lbs./linear ft.
- (5) Open Area: 33.7 sq. in./linear ft.
- (6) ANSI Rating: Medium Duty.
- (7) DIN Rating: Class B.
- (8) Application: Heel-Proof, Pedestrian.
- (9) Slot Width: ¼-inch.
- (10) ADA compliant.
- (11) Ductile iron conforms to ASTM A536, Grade 80-55-06.
- (12) Hot-Dip Galvanizing conforms to ASTM A123.

PART 3 - EXECUTION

3.1 FORM WORK:

- A. Coordinate installation of joint materials, vapor barrier/retarder, and other related materials with placement of forms and reinforcing steel.
- B. Design, erect, support, brace, and maintain formwork to support vertical and lateral loads, and static and dynamic loads that might be applied until such loads can be supported by the concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment elevations, and position.
- C. Construct forms in accordance with ACI 347, to sizes, shapes, lines and dimensions indicated, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, molding, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
- D. Fabricate forms for easy removal without hammering or prying against the concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.
- E. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace

temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous location.

- F. Chamfer exposed corners and edges 3/4" unless otherwise indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- G. Preparation of Form Surfaces: Coat the contact surfaces of forms with a form-coating compound where applicable before reinforcement is placed.
- H. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such ties. Accurately place and securely support items built in to form.
- I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms after concrete placement, if required, to eliminate mortar leaks.

3.2 VAPOR RETARDER INSTALLATION:

- A. Following leveling and tamping of granular base for slabs-on-grade, place vapor retarder in position with longest dimension parallel with direction of pour.
- B. Lap joints 6" and seal with manufacturers recommended mastic or pressure sensitive tape.
- C. Seal all penetrations and edges as recommended by Manufacturer.

3.3 PLACING REINFORCEMENT:

- A. Comply with the Concrete Reinforcing Steel Institute (CRSI) recommended practice for "Placing Reinforcing Bars" for details and methods of reinforcement placement and supports, and as herein specified.
 - 1. Avoid cutting or puncturing vapor retarders during reinforcement placement and concreting operations.
- B. Clean reinforcement of loose rust, mill scale, dirt, and other materials or coatings which reduce or destroy bond with concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers as required.
- D. Place reinforcement to obtain minimum coverages indicated, or if not indicated, in compliance with CRSI. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Do not place bars more than 2" beyond the last leg of continuous support. Do not use supports to hold runways for conveying equipment.

- F. Install mesh welded wire fabric reinforcement in as long lengths as practicable, lapping pieces at least one mesh plus 2" but in no case less than 8". Lace splices with wire. Offset end laps to prevent continuous laps in either direction. Lift mesh to middle third of slab by use of hooks.

3.4 JOINTS AND INSERTS:

- A. Joints: Provide construction and expansion joints. Locate and install joints, which are not shown on the Drawings, so as not to impair the strength and appearance of structure. Submit joint schedule and details to Architect.
 - 1. Waterstops: Provide waterstops in construction joints as indicated. Install to form continuous diaphragm in each joint. Support and protect exposed waterstops during progress of work. Field-fabricate joints in waterstops according to manufacturer's printed instructions.
- B. Inserts: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, concrete. Properly locate embedded items in cooperation with other trades, and secure in position before concrete is poured. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.

3.5 PREPARATION OF FORM SURFACES

- A. Coat contact surfaces of forms with an approved nonresidual, low-VOC, form-coating compound before reinforcement is placed. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

3.6 CONCRETE PLACEMENT:

- A. Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete", and as herein specified.
- B. Pre-Placement Inspection: Before placing concrete, clean and inspect formwork, reinforcing steel, and items to be embedded or cast-in. Notify other crafts in ample time to permit the installation of their work, and cooperate with them in setting such work, as required. Make sure soil treatment for termite control has been applied to cushion fill before vapor retarder and concrete are installed. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.
- C. Notify Architect 48 hours before placing any concrete.
- D. Conveying: Convey concrete from the mixer to the place of final deposit by methods which will prevent the separation or loss of materials. Provide equipment for chuting, pumping, and pneumatically conveying concrete of proper size and design as to insure a practically continuous flow of concrete at the point of delivery and without segregation of the materials. Keep open troughs and chutes clean and free from coatings of hardened concrete. Do not allow concrete to drop freely more than 10 feet. All equipment and methods used for conveying are subject to the approval of Architect.

- E. Depositing: Deposit concrete continuously or in layers of such thickness that no concrete will be placed on hardened concrete so as to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete near or in its final location to avoid segregation due to rehandling or flowing, and displacement of the reinforcement.

- F. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

- G. 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 with straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps and hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 - 3. Maintain reinforcing in proper position during concrete placement.

- H. Cold Weather Placing: Comply with the requirements of ACI 306 and as follows:
 - 1. Protect concrete work from physical damage and reduced strength that could be caused by frost, freezing actions, and low temperatures.
 - 2. When air temperature has fallen to or is expected to fall below 40°F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50°F and not more than 80°F at point of placement.
 - a. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - b. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators unless otherwise accepted for mix designs.

I. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with the requirements of ACI 305 and as follows:

1. 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 to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
3. When acceptable to Architect, and when required by high temperatures, low humidity, or other adverse placing conditions, use an approved water-reducing retarding admixture.

3.7 FINISH OF FORMED SURFACES:

- 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" 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, painting 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. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 SLAB FINISHES:

- A. General: Refer to Structural Drawings, Sheet S001 – General Notes, “Slab Flatness and Levelness” for specific Floor Flatness (FF) and Floor Levelness (FL) requirements. F-number requirements vary depending on locations of concrete slabs and final floor finishes to be installed on slabs.
- B. Float Finish:
 1. Apply float finish to slab surfaces to receive trowel finish and other finishes specified.
 2. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven

floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Finish surfaces to tolerances as shown on Structural Drawings and as measured according to ASTM E1155 and ACI 117. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to uniform, smooth, granular texture.

C. Trowel Finish:

1. Apply where exposed-to-view, and where slab surfaces are to be covered with tile, paint, resilient flooring, carpet, or other thin film finish coating system.
2. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances as shown on Structural Drawings and as measured according to ASTM E1155 and ACI 117. Grind smooth surface defects which would telegraph through applied floor covering.

D. Trowel And Fine Broom Finish: Where tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.

E. Non-Slip Broom Finish: Apply at exterior concrete steps, ramps, walks, and mowing strips indicated on the Drawings.

3.9 CONCRETE CURING AND PROTECTION:

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures; maintain concrete above 50°F. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

B. Curing Methods: Perform curing of concrete by moist curing, by moisture-retaining cover curing, and by combinations thereof, as specified.

1. Provide moisture curing by keeping concrete surface continuously wet by covering with water, by water-fog spray, or by covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.
2. Provide moisture-cover curing by covering concrete surface with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Provide curing and sealing compound on exterior slabs, walks, and curbs, as follows:

- a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - b. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.
- C. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- D. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor toppings, and other flat surfaces by application of appropriate curing compound. Final cure concrete surfaces to receive finish flooring by moisture-retaining cover, unless otherwise directed.

3.10 REMOVAL OF FORMS:

- A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of work, may be removed after cumulatively curing at not less than 50°F for 24 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, joists, slabs, and other structural elements, may be removed after 14 days if concrete has attained at least 75% of design minimum compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.

3.11 REUSE OF FORM:

- A. Clean and repair surfaces of forms to be reused in work. Split, frayed, delaminated or otherwise damaged form material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces except as acceptable to Architect.

3.12 MISCELLANEOUS ITEMS:

- A. Filling In: Fill in holes and openings left in concrete for the passage of work by other trades after their work is in place. Mix, place, and cure concrete to blend with in-place construction. Provide all other miscellaneous concrete filling required to complete work.

- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to hard, dense finish and corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

3.13 CONCRETE SURFACE REPAIRS:

- A. Repair and patch defective areas with cement mortar of the same type and class as the original concrete, immediately after removal of forms. Cut out honeycomb, rock pockets, voids over 1/2" diameter, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface, before placing cement mortar in the same manner as adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.
 - 1. Smooth, Exposed-To-View Surfaces: Blend cements so that, when dry, patching mortar will match color of surrounding concrete. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
 - 2. Concealed Formed Surfaces: Repair defects that adversely affect the durability of the concrete. If defects cannot be repaired remove and replace the concrete.
 - 3. Other repair methods may be used, subject to acceptance by Architect.

3.14 FIELD SAMPLING AND TESTING:

- A. The following samples and tests will be performed by an independent testing laboratory approved by Owner and Architect. Refer to paragraph 1.5 C. of this section for responsibility for payment of tests.
- B. Samples:
 - 1. Field samples shall be made and cured in accordance with ASTM C 31, for each concrete strength, at the rate of 4 test cylinders and one slump test for each 50 cubic yards of concrete from each day's pour. In accordance with ASTM C 173 Volumetric Method, or ASTM C 231 Pressure Method, make air content check for each set of test cylinders. Air content and slump shall be checked and recorded at both truck discharge and point of placement for pumped concrete from the first load each day.
 - 2. Test cylinders as follows: One at 7 days, two at 28 days, and reserve the remaining for testing after a longer period as required by Architect, if the 28 day tests do not meet the required strength.
 - 3. The taking of samples from small pours of 10 cubic yards or less may be omitted at the discretion of the Architect.
 - 4. Additionally, test slump every 25 cu. yds, recording location for report.
 - 5. When early form removal is requested, field cure cylinders tested at 7 or less days to determine sufficient strength.

C. Testing:

1. Where average strength of any group of 3 cylinders falls below the minimum compressive strength or if individual cylinder falls more than 500 psi below minimum compressive strength specified, the Architect shall have the right to require that test specimens be cut from the structure. Specimens shall be selected by Architect from location in structure represented by test specimen or specimens which failed.
2. Specimens shall be secured, prepared, and tested in accordance with ASTM C 42, within a period of 60 days after placing concrete.
3. Concrete shall be considered to meet the strength requirement of this specification if it meets the strength requirements of paragraph 5.6.4 of ACI 318.
4. Should laboratory analysis indicate that the proper concrete mix has not been used by the Contractor, all such concrete poured using the improper mix shall be subject to rejection.
5. The cost of cutting specimens from the structure, patching the resulting holes, and making the laboratory analysis shall be borne by the Contractor.
6. The holes from which the cored samples are taken shall be packed solid with no slump concrete proportioned in accordance with the ACI 211 "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete". The patching concrete shall have the same design strength as the specified concrete.
7. If any of the specimens cut from the structure fail to meet the requirements outlined in paragraph 5.6.4 of ACI 318, the Architect shall have the right to require any and all defective concrete to be replaced, and all costs resulting therefrom shall be borne by the Contractor.

D. Contractor Sampling: In addition to the slump tests specified above, the contractor shall keep a cone (mold) and rod apparatus on the job site for random testing of batches. When concrete does not meet the specified slump requirements, and when directed by the Architect, immediately perform a slump test in accordance with ASTM C 143. Concrete not meeting the slump requirements shall be removed from the job site.

3.15 PROTECTION:

- A. No wheeling, working, or walking on finished surfaces will be allowed for 16 hours after the concrete is placed.
- B. Provide plywood or other acceptable protective cover at all traffic areas throughout the job.
- C. Protect exposed concrete floors, steps, and walks from paint and other materials or equipment which may mar or damage these surfaces.

3.16 CLEAN-UP

- A. Do not allow debris to accumulate. Clean up all concrete and cement materials, equipment and debris upon completion of any portion of the concrete work, and upon completion of entire cast-in-place concrete work.

END OF SECTION 033000

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SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes structural steel and grout.
- B. Reference Standards:
 - 1. American Society for Testing and Materials (ASTM):
 - a. **ASTM A36** – Standard Specification for Carbon Structural Steel.
 - b. **ASTM A53** – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - c. **ASTM A325** – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength [*Withdrawn 2016. Replaced by ASTM F3125.*]
 - d. **ASTM A490** – Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength [*Withdrawn 2016. Replaced by ASTM F3125.*]
 - e. **ASTM A500** – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - f. **ASTM A992** – Standard Specification for Structural Steel Shapes.
 - g. **ASTM C1107** – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
 - h. **ASTM F3125** – Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.
 - i. **ASTM F436** – Standard Specification for Hardened Steel Washers Inch and Metric Dimensions.
 - j. **ASTM F1852** – Standard Specification for “Twist Off” Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength [*Withdrawn 2016. Replaced by ASTM F3125.*]
 - 2. American Welding Society (AWS):
 - a. **AWS D1.1** – Structural Welding Code, Steel.
 - 3. Master Painter Institute (MPI):
 - a. **MPI #79** – Primer, Alkyd, Anti-Corrosive for Metal.
 - 4. Research Council on Structural Connections (RCSC).
 - 5. The Society for Protective Coatings (SSPC):
 - a. **SSPC SP-2** – Hand Tool Cleaning.
 - b. **SSPC SP-3** – Power Tool Cleaning.

6. American Institute of Steel Construction (AISC):

- a. **AISC 303** – Code of Standard Practice for Steel Buildings and Bridges.
- b. **AISC 360** – Specification for Structural Steel Buildings.

C. Related Sections:

- 1. Section 099110 – PAINTING.

1.2 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components, including connections, splices, holes, welds, and bolts.
- C. Welding certificates.
- D. Mill test reports for structural steel, including chemical and physical properties.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC 303 – "Code of Standard Practice for Steel Buildings and Bridges."
 - 2. AISC 360 – "Specification for Structural Steel Building".
 - 3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M, Grade 50 .
- B. Channels, Angles, M or S-Shapes: ASTM A 36/A 36M.
- C. Plate and Bar: ASTM A 36/A 36M.

- D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.
- E. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
- F. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts Twist off type or with direct tension indicators; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.
- B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
 - 1. Finish: Plain.
- C. Threaded Rods: ASTM A 36/A 36M .
 - 1. Finish: Plain.

2.3 PRIMER

- A. Primer: Comply with Section 099110 – PAINTING. Primer requires SSPC-SP 2 surface preparation or better and 24 hours' drying before recoating.
- B. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug Tightened.

- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
 - 2. Surfaces to be field welded.
 - 3. Surfaces to be high-strength bolted with slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 - 1. SSPC-SP 2, "Hand Tool Cleaning."
 - 2. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: 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 2.0 mils.. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

2.8 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
 - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- C. Bolted Connections: Shop bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
 - 1. Fillet Welded Connections: Visual inspection.
 - 2. Full Penetration Welded Connections: Ultrasonic inspection.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Base Plates: 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.
 - 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. 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.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug Tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.
- B. Bolted Connections: Bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.

- D. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

END OF SECTION 051200

SECTION 053100 - STEEL DECK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Reference Standards
 - 1. American Society for Testing and Materials (ASTM):
 - a. **ASTM A108** - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
 - b. **ASTM A653** – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - c. **ASTM A780** – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - d. **ASTM E329** - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
 - e. **ASTM E548** – Standard Guide for General Criteria Used for Evaluating Laboratory Competence [*Withdrawn standard. No replacement.*]
 - 2. American Iron and Steel Institute (AISI).
 - 3. American Welding Society (AWS):
 - a. **AWS D1.1** – Structural Welding Code, Steel.
 - b. **AWS D1.3** – Structural Welding Code, Steel Sheet.
 - 4. Federal Specifications (FS):
 - a. **TT-P-664** – Primer Coating, Alkyd, Corrosion-Inhibiting, Lead and Chromate Free, Voc-Compliant.
 - 5. Steel Deck Institute (SDI).

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Roof deck.
- B. Related Sections include the following:
 - 1. Section 051200 - STRUCTURAL STEEL FRAMING for shop-welded shear connectors.
 - 2. Section 055000 - METAL FABRICATIONS for framing deck openings with miscellaneous steel shapes.
 - 3. Section 075423 - SINGLE PLY ROOFING SYSTEM (TPO).

4. Section 099110 – PAINTING for repair of deck special coatings.

1.3 SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, deck openings, special jointing, accessories, and attachments to other construction.
- C. Product Certificates: Signed by steel deck manufacturers certifying that products furnished comply with requirements.
- D. Welding Certificates: Copies of certificates for welding procedures and personnel.
- E. Product Test Reports: From a qualified testing agency indicating that each of the following complies with requirements, based on comprehensive testing of current products:
 1. Mechanical fasteners.
- F. Research/Evaluation Reports: Evidence of steel deck's compliance with building code in effect for Project, from a model code organization acceptable to Authorities Having Jurisdiction (AHJ).

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed steel deck similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Testing Agency Qualifications: An independent testing agency, acceptable to Authorities Having Jurisdiction (AHJ), qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
- C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- D. AISI Specifications: Calculate structural characteristics of steel deck according to AISI's "Specification for the Design of Cold-Formed Steel Structural Members."

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- 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. Steel Deck:
 - a. BHP Steel Building Products USA Inc.
 - b. Consolidated Systems, Inc.
 - c. Epic Metals Corp.
 - d. Marlyn Steel Products, Inc.
 - e. Nucor Corp.; Vulcraft Div.
 - f. New Millennium, Inc.
 - g. United Steel Deck, Inc.
 - h. Verco Manufacturing Co.
 - i. Wheeling Corrugating Co.; Div. of Wheeling-Pittsburgh Steel Corp.
 - J. Or Approved Equivalent.

2.2 ROOF DECK

- A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 29, and the following:
1. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), G60 (Z180) zinc coating. Shop primed bottom.
 2. Deck Profile Type: Cellular.
 3. Profile Depth: 3 inches.
 4. Steel Thickness: 20 gage.
 5. Span Condition: 2 span min.
 6. Side Laps: Overlapped.
 7. Refer to Structural Drawings, Sheet S101 for additional information.

2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8 mm) minimum diameter.
- D. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

- E. Steel Sheet Accessories: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.
- F. Galvanizing Repair Paint: ASTM A 780.
- G. Repair Paint: Lead- and chromate-free rust-inhibitive primer complying with performance requirements of FS TT-P-664.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 29, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels, if required to meet deflection limitations.
- C. Locate decking bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to decking.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of decking, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF DECK INSTALLATION

- A. Fasten roof deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter, but not less than 1-1/2 inches (38 mm) long, and as follows:

1. Per structural drawings.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span or 18 inches (450 mm), and as follows:
 1. Per structural drawings.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:
 1. End Joints: Lapped 2 inches (51 mm) minimum.
- D. Miscellaneous Roof Deck Accessories: Install ridge and valley plates, finish strips, cover plates, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld to substrate to provide a complete deck installation.

3.4 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing agency to perform field quality-control testing.
- B. Field welds will be subject to inspection.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work that does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on top surface of prime-painted deck immediately after installation and apply repair paint.
- C. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 053100

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous steel framing and supports.
2. Miscellaneous steel trim.

1.2 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):

1. **ASTM A27** – Standard Specification for Steel Castings, Carbon, for General Application.
2. **ASTM A36** - Standard Specification for Carbon Structural Steel.
3. **ASTM A47** – Standard Specification for Ferritic Malleable Iron Castings.
4. **ASTM A53** - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
5. **ASTM A276** – Standard Specification for Stainless Steel Bars and Shapes.
6. **ASTM A500** - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
7. **ASTM A780** – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
8. **ASTM B633** - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
9. **ASTM C1107** - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink.)
10. **ASTM D1187** - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
11. **ASTM F1941** – Standard Specification for Electrodeposited Coatings on Mechanical Fasteners, Inch and Metric.
12. **ASTM F2329** - Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

C. Master Painter Institute (MPI):

1. **MPI #79** – Primer, Alkyd, Anti-Corrosive for Metal.

D. The Society for Protective Coatings (SSPC):

1. **SSPC-PA1** – Shop, Field, and Maintenance Coating of Metals.
2. **SSPC-Paint 20** – Zinc-Rich Primers (Type I, Inorganic, and Type II, Organic).

E. National Association of Architectural Metal Manufacturers (NAAMM).

1.3 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details for metal fabrications.
 - 1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.

2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
- C. Steel Tubing: ASTM A 500, cold-formed steel tubing.
- D. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls.
 - 1. Provide stainless-steel fasteners for fastening aluminum.
 - 2. Provide stainless-steel fasteners for fastening stainless steel.
 - 3. Provide stainless-steel fasteners for fastening nickel silver.
 - 4. Provide bronze fasteners for fastening bronze.
- B. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.
- C. Post-Installed Anchors: chemical anchors.

2.4 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Section 099110 - PAINTING.
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- F. Concrete: Comply with requirements in Section 033000 - CAST-IN-PLACE CONCRETE for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa).

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- C. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.
- E. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- F. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors not less than 24 inches (600 mm) o.c.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

2.7 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
- C. Galvanize all exterior miscellaneous steel trim.

2.8 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - 1. Steel pipe and tube handrails and railing systems for exterior guardrails, steps, and ramps in locations as shown on the Drawings.
 - 2. All exterior handrails and railing systems shall be hot-dipped galvanized with a painted finish.

1.2 DEFINITIONS

- A. Definitions in ASTM E 985 “Standard Specification for Permanent Metal Railing Systems and Rails for Buildings”, for railing-related terms apply to this Section.

1.3 RELATED SECTIONS

- A. Section 033000 – CAST-IN-PLACE CONCRETE.
- B. Section 055000 – METAL FABRICATIONS.
- C. Section 099110 – PAINTING.

1.4 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. **ASTM A36** – Standard Specification for Carbon Structural Steel.
 - 2. **ASTM A47** – Standard Specification for Ferritic Malleable Iron Castings.
 - 3. **ASTM A48** – Standard Specification for Gray Iron Castings.
 - 4. **ASTM A53** – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 5. **ASTM A500** – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - 6. **ASTM A501** – Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
 - 7. **ASTM B633** - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
 - 8. **ASTM B696** - Standard Specification for Coatings of Cadmium Mechanically Deposited.
 - 9. **ASTM C1107** - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
- B. Military Specifications - Department of Defense (DOD) Standards:
 - 1. **DOD-P-21035** – Specification Galvanizing Repair Coating.

- C. Federal Specifications (FS):
 - 1. **FS-TT-P-664** – Primer Coating, Alkyd, Corrosion-Inhibiting, Lead And Chromate Free, Voc-Compliant.
- D. The Society for Protective Coatings (SSPC):
 - 1. **SSPC-Paint 5** – Zinc Dust, Zinc Oxide and Phenolic Varnish Paint [Discontinued 2005].
 - 2. **SSPC-Paint 12** – Cold Applied Asphalt Mastic Paint (Extra Thick Film) [Discontinued 2005].
 - 3. **SSPC-Paint 20** – Zinc-Rich Primers (Type I, Inorganic, and Type II, Organic).
- E. National Association of Architectural Metal Manufacturers (NAAMM).
- F. American Iron and Steel Institute (AISI).
- G. National Ornamental and Miscellaneous Metal Association (NOMMA) – Voluntary Joint Finish Standards.

1.5 PERFORMANCE REQUIREMENTS

- A. General: In engineering handrail and railing systems to withstand structural loads indicated, determine allowable design working stresses of materials based on the following:
 - 1. Cold-Formed Structural Steel: AISI "Specification for the Design of Cold-Formed Steel Structural Members."
- B. Structural Performance of Handrails and Railing Systems: Engineer, fabricate, and install handrails and railing systems to withstand the following structural loads without exceeding the allowable design working stress of the materials for handrails, railing systems, anchors, and connections. Apply each load to produce the maximum stress in each of the respective components comprising handrails and railing systems.
 - 1. Top Rail of Guardrail Systems: Capable of withstanding the following loads applied as indicated:
 - a. Concentrated load of 250 lbf (890 N) applied at any point and in any direction.
 - b. Uniform load of 50 lbf per linear foot (730 N/m) applied horizontally and concurrently with uniform load of 100 lbf per linear foot (1460 N/m) applied vertically downward.
 - c. Concentrated and uniform loads above need not be assumed to act concurrently.
 - 2. Handrails Not Serving as Top Rails: Capable of withstanding the following loads applied as indicated:
 - a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.

- b. Uniform load of 50 lbf per linear foot (730 N/m) applied in any direction.
 - c. Concentrated and uniform loads above need not be assumed to act concurrently.
 - 3. Infill Area of Guardrail Systems: Capable of withstanding a horizontal concentrated load of 200 lbf (890 N) applied to 1 sq. ft. (0.09 sq. m) at any point in the system including panels, intermediate rails, balusters, or other elements composing the infill area.
 - a. Above load need not be assumed to act concurrently with loads on top rails of railing systems in determining stress on guard.
- C. Thermal Movements: Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in engineering, fabricating, and installing handrails and railing systems to prevent buckling, opening of joints, overstressing of components and connections, and other detrimental effects. Base engineering calculation on actual 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.
- D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.6 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Shop drawings showing fabrication and installation of handrails and railing systems including plans, elevations, sections, details of components, and attachments to other units of Work.

1.7 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain handrails and railing systems of each type and material from a single manufacturer.
- B. Engineer Qualifications: Professional engineer currently licensed to practice in Arkansas and experienced in providing engineering services of the kind indicated for handrails and railing systems similar to this Project in material, design, and extent, and that have a record of successful in-service performance.

1.8 STORAGE

- A. Store handrails and railing systems inside a well-ventilated area, away from uncured concrete and masonry and protected from weather, moisture, soiling, abrasion, extreme temperatures, and humidity.

1.9 PROJECT CONDITIONS

- A. Field Measurements: Where handrails and railing systems are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.10 SEQUENCING AND SCHEDULING

- A. Sequence and coordinate installation of wall handrails as follows:
 - 1. Mount handrails only on completed walls. Do not support handrails temporarily by any means not satisfying structural performance requirements.
 - 2. Mount exterior handrails on concrete or masonry assemblies utilizing appropriate fasteners for the substrate.

PART 2 - PRODUCTS

2.1 METALS

- A. General: Provide metals free from surface blemishes where exposed to view in the finished unit. Exposed-to-view surfaces exhibiting pitting, seam marks, roller marks, stains, discolorations, or other imperfections on finished units are not acceptable.
- B. Steel and Iron: Provide steel and iron in the form indicated, complying with the following requirements:
 - 1. Steel Pipe: ASTM A 53; finish, type, and weight class as follows:
 - a. Hot-dip galvanized finish for exterior conditions, unless otherwise indicated.
 - b. Type F, standard weight (schedule 40), unless otherwise indicated, or another weight, type, and grade required by structural loads.
 - 2. Steel Tubing: Product type (manufacturing method) and other requirements as follows:
 - a. Cold-Formed Steel Tubing: ASTM A 500, grade as indicated below:
 - 1) Grade A, unless otherwise indicated or required by structural loads.
 - b. Hot-Formed Steel Tubing: ASTM A 501.
 - 3. Steel Plates, Shapes, and Bars: ASTM A 36.
 - 4. Gray Iron Castings: ASTM A 48, Class 30.
 - 5. Malleable Iron Castings: ASTM A 47, Grade 32510.
- C. Brackets, Flanges, and Anchors: Cast or formed metal of the same material and finish as supported rails, unless otherwise indicated.

2.2 WELDING MATERIALS, FASTENERS, AND ANCHORS

- A. Welding Electrodes and Filler Metal: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of the type, grade, and class required to produce connections that are suitable for anchoring railings to other types of construction indicated and capable of withstanding design loadings.
 - 1. For steel railings and fittings, use plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating, or ASTM B 696, Class 12 for cadmium plating.
- C. Fasteners for Interconnecting Railing Components: Use fasteners of same basic metal as the fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.
 - 1. Provide concealed fasteners for interconnecting railing components and their attachment to other work, except where otherwise indicated.

2.3 PAINT

- A. Shop Primers: Provide primers to comply with applicable requirements of Section 099110 - PAINTING.
- B. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer, selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure, complying with performance requirements of FS TT-P-664.
- C. Shop Primer for Galvanized Steel: Zinc-dust, zinc-oxide primer formulated for priming zinc-coated steel and compatibility with finish paint systems indicated, complying with SSPC-Paint 5.
- D. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, complying with DOD-P-21035 or SSPC-Paint 20.
- E. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers.

2.4 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

- B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without need for protection by a sealer or waterproof coating and is recommended for exterior use by manufacturer.
- C. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Nonshrink, Nonmetallic Grouts:
 - a. B-6 Construction Grout; W.R. Bonsal Co.
 - b. Sure-grip High Performance Grout; Dayton Superior Corp.
 - c. Sealtight 588 Grout; W.R. Meadows, Inc.
 - d. SonogROUT 14; Sonneborn Building Products--ChemRex, Inc.
 - e. Kemset; The Spray-Cure Company.
 - f. Or approved equivalent product.

2.5 FABRICATION

- A. General: Fabricate handrails and railing systems to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of hollow members, post spacings, and anchorage, but not less than those required to support structural loads.
- B. Assemble handrails and railing systems in the shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- C. Form changes in direction of members as follows:
 - 1. By radius bends of radius indicated.
 - 2. By mitering at elbow bends.
 - 3. By insertion of prefabricated flush elbow fittings.
 - 4. By any method indicated above, applicable to change of direction involved.
- D. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.
- E. Welded Connections: Fabricate handrails and railing systems for connection of members by welding. For connections made during fabrication, weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.

4. At tee and cross intersections, cope ends of intersecting members to fit contour of pipe or tube to which end is joined, and weld all around.
 5. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
 6. See Attachment 1 at the end of this section for NOMMA and NAAMM standards of visual appearance for welded joint connections for pipe and tube members used in stair and ramp handrail and guardrail construction. Visual appearance of weld for this project shall be Type 2 (Finish #3): "Weld of good appearance used in areas of traffic where highly ornamental quality is not required."
- F. Brackets, Flanges, Fittings, and Anchors: Provide manufacturer's standard wall brackets, flanges, miscellaneous fittings, and anchors to interconnect handrail and railing system members to other construction.
- G. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.
- H. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing work.
- I. Cut, reinforce, drill, and tap components, as indicated, to receive finish hardware, screws, and similar items.
- J. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated.
- K. Fillers: Provide steel sheet or plate fillers, of thickness and size indicated or required to support structural loads of handrails, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses to produce adequate bearing to prevent bracket rotation and overstressing substrate.

2.6 FINISHES, GENERAL

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering prior to shipment.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one half of the range of approved samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved samples and they are assembled or installed to minimize contrast.

2.7 STEEL FINISHES

- A. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed railings:

1. Interiors (SSPC Zone 1A): SSPC-SP 7 "Brush-Off Blast Cleaning."
- B. Apply shop primer to prepared surfaces of handrails and railing components, unless otherwise indicated. Comply with requirements of SSPC-PA 1 "Paint Application Specification No. 1" 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 all edges, corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installing anchorages, such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors, that are to be embedded in concrete and masonry construction. Coordinate delivery of such items to Project site.

3.2 INSTALLATION, GENERAL

- A. Fit exposed connections accurately together to form tight, hairline joints.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing handrails and railing systems. Set handrails and railing systems accurately in location, alignment, and elevation, measured from established lines and levels and free from rack.
1. Do not weld, cut, or abrade surfaces of handrails and railing components that have been coated or finished after fabrication and are intended for field connection by mechanical or other means without further cutting or fitting.
 2. Set posts plumb within a tolerance of 1/4 inch in 12 feet (2 mm in 1 m).
 3. Align rails so that variations from level for horizontal members and from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (2 mm in 1 m).
- C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and welded surface matches contours of adjoining surfaces.
- D. Adjust handrails and railing systems prior to anchoring to ensure matching alignment at abutting joints. Space posts at interval indicated but not less than that required by design loadings.

- E. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing handrails and railing systems and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

- A. Welded Connections: Use fully welded joints for permanently connecting railing components by welding. Cope or butt components to provide 100 percent contact, or use fittings designed for this purpose. Refer to paragraph 2.5.E.6 of this section for welded joint finish type information.

3.4 ATTACHING HANDRAILS TO WALLS

- A. Attach handrails to wall with wall brackets and end fittings. Provide bracket with 1-1/2-inch (38-mm) clearance from inside face of handrail to finished wall surface.
- B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- C. Secure wall brackets and wall return fittings to building construction as follows:
 - 1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.

3.5 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material.

3.6 PROTECTION

- A. Protect finishes of handrails and railing systems from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so that no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

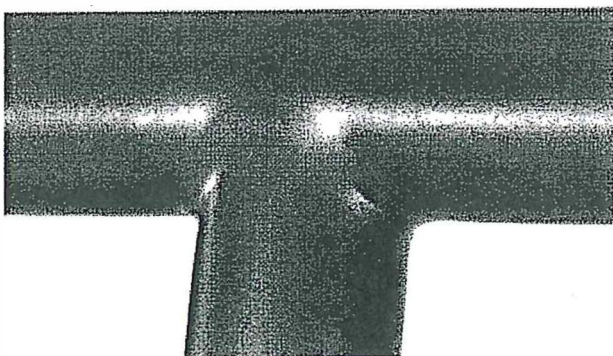
END OF SECTION 055213

CONSTRUCTION DETAILS

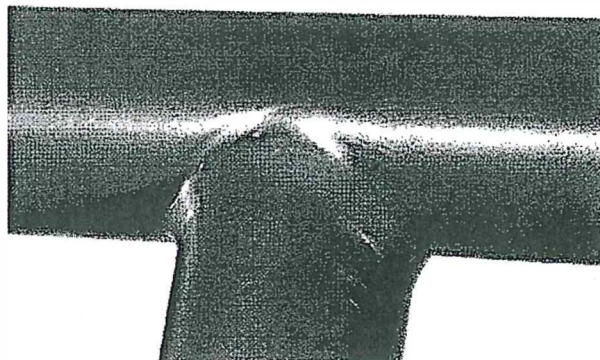
Railing System Joint Construction

Welded Steel Pipe or Tubing with Prime Coat of Paint Applied

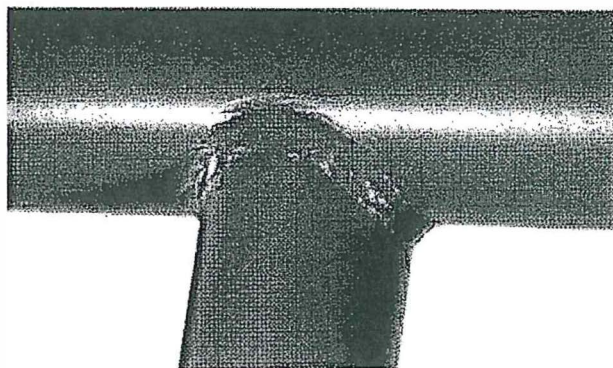
- Type 1 — Ornamental quality —
used where appearance is a critical factor
- Type 2 — Weld of good appearance used in areas of traffic —
where highly ornamental quality is not required
- Type 3 — Used in areas where it is not subject to view —
as in service stairs
- Type 4 — Acceptable when appearance is not a factor —
used in industrial and non-public areas



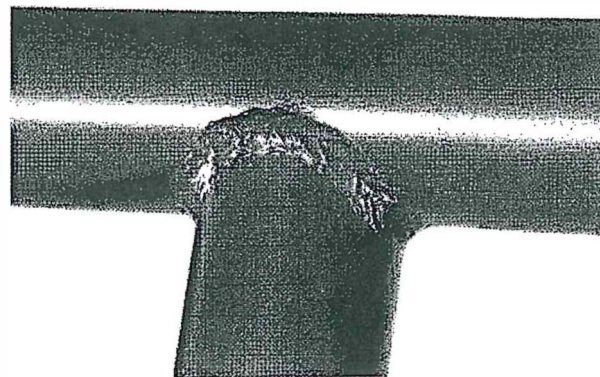
Type 1



Type 2



Type 3



Type 4

The above descriptions for Railing System Joint Construction are based on “Voluntary Joint Finish Standards” developed by the National Ornamental & Miscellaneous Metals Association (NOMMA). Photographs were provided through the courtesy of NOMMA.

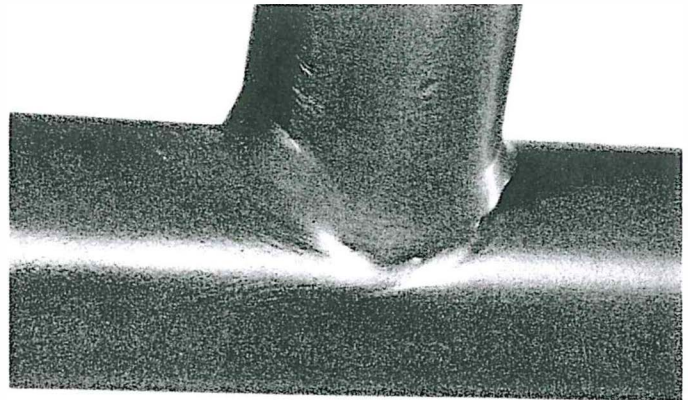
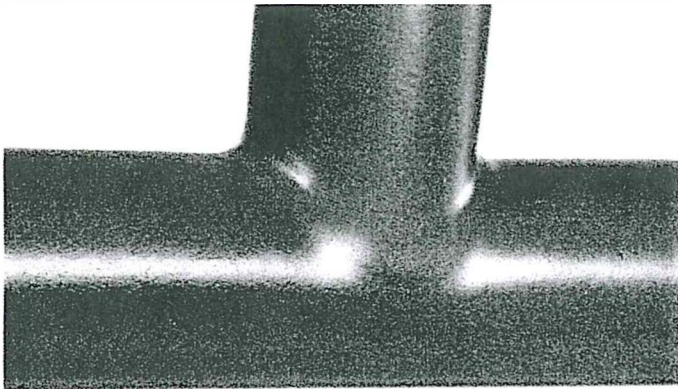
Guideline 1: Joint Finishes

These voluntary guidelines were developed by the NOMMA Standards Committee, with strong input from the membership.

All samples shown are primed steel.

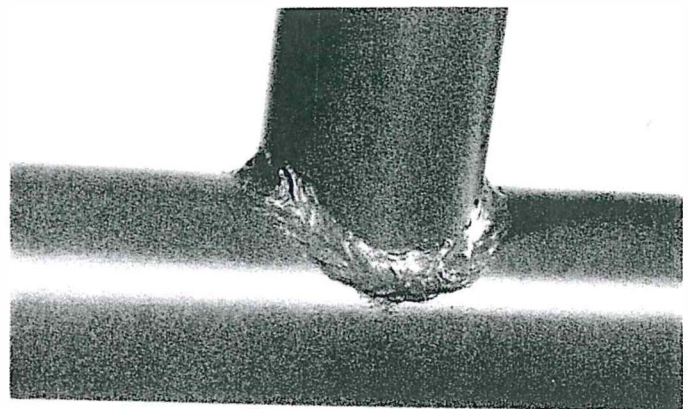
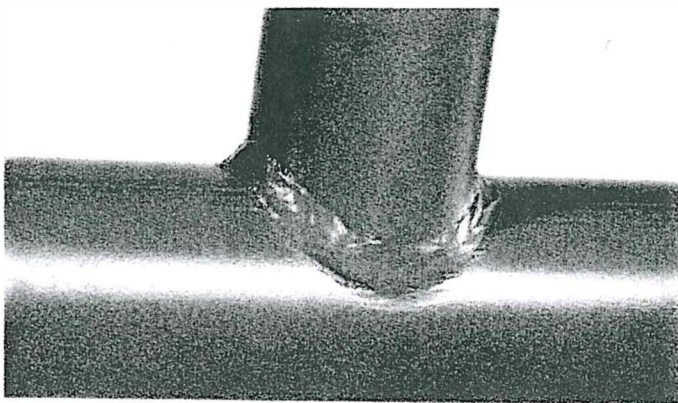


Example C: 1½" to 1½" pipe "T"



Finish #1 - No evidence of a welded joint.

Finish #2 - Completely sanded joint, some undercutting and pinholes OK.



Finish #3 - Partially dressed weld with spatter removed.

Finish #4 - Good quality, uniform undressed weld with minimal spatter.

These guidelines are voluntary recommendations for informational purposes only. It is the responsibility of the individual to ensure proper construction design, method, and materials and code compliance.

The use of fillers is not included in the scope of this work. The guidelines do not endorse or discourage use of fillers. They deal with finished appearance only.

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Furnish and install all blocking, framing and other rough carpentry, as shown on the Drawings and as specified herein. Wood framing and blocking installed on or above the roof deck shall be pressure treated to prevent rot.

1.2 QUALITY ASSURANCE

- A. Reference Standards. Comply with the following:
1. The Engineered Wood Association (APA):
 - a. **APA PRP-108** – Performance Standards and Qualification Policy for Wood Structural Panels.
 2. American Wood Preservers Association (AWPA):
 - a. **AWPA Standard C9** – Plywood – Preservative Treatment by Pressure Process.
 3. International Building Code (IBC): Local adopted edition.
 4. Military Specifications (MIL):
 - a. **MIL-A-397B** – Adhesive, Room-Temperature and Intermediate-Temperature Setting Resin (Phenol, Resorcinol, and Melamine Based) [Superseded. Use MIL-A-22397 or MIL-A-46051].
 - b. **MIL-A-5534A** – Adhesive, High-Temperature-Setting Resin, (Phenol, Melamine, and Resorcinol Base).
 - c. **MIL-A-22397** – Adhesive, Phenol and Resorcinol Resin Base (for Marine Service Use).
 - d. **MIL-A-46051** – Adhesive, Room-Temperature and Intermediate-Temperature Setting Resin (Phenol, Resorcinol and Melamine Base) [Superseded. Use MIL-A-48611].
 - e. **MIL-A-48611** – Adhesive System, Epoxy-Elastomeric, for Glass to Metal.
 5. Southern Pine Association (SPA) – Standard Grading Rules.
 6. Southern Pine Inspection Bureau (SPIB).
 7. U.S. Department of Commerce Product Standard (PS):
 - a. **PS1-95** – Construction and Industrial Plywood with typical APA Grade Trademarks.
 - b. **PS20-15** – American Softwood Lumber Standards.
 8. West Coast Lumber Inspection Bureau (WCLIB).

9. Western Wood Products Association (WWPA) – Standard Grading Rules for Western Lumber
- B. Lumber Standard and Grade-Marking: Each piece of lumber and each board shall comply with the American Standards PS20-15 and with specific grading requirements of the Association recognized as covering the species used and under whose grading rules it is identified by the grade-mark of a recognized association or independent inspection agency.
- C. Plywood: Plywood shall conform to U.S. Product Standard PS-1-95 issued by the National Bureau of Standards. Each standard size panel shall be stamped or branded to show the type and grade of the panel. When used structurally, plywood shall meet performance standards for its type as described in Product Standard PS 1-95 for Douglas Fir plywood. It shall be identified as to species, grade and glue type by an approved agency or independent testing laboratory by means of appropriate grademarks on each panel. Exterior grade plywood shall be used at all exterior locations.
- D. Laminating Adhesive shall meet requirements of MIL-A-397B or MIL-A-5534A.
- E. Moisture Content of various materials shall meet the following requirements at time of installation:
1. Framing lumber 2 inches and less in thickness. Not more than 19 percent.
 2. Boards:
 - a. 8 inches or less in width, not more than 19 percent.
 - b. Wider than 8 inches, Not more than 15 percent.
- F. Qualifications of Workmen: Provide sufficient workmen and supervisors who shall be present at all times during execution of this portion of the Work, and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.
- G. Product Handling:
1. Delivery and Storage: Store all materials in such a manner as to ensure proper ventilation and drainage and to protect against damage and the weather.
 2. Protection: Use extreme care in the off-loading of lumber to prevent damage, splitting, and breaking of materials.

PART 2 - PRODUCTS

2.1 LUMBER

- A. Lumber for structural capacity may be any of the following species provided the grade for each is not lower than the minimum shown:
1. Cedar, Western Red, and Incense - WCLIB Rules Standard.
 2. Fir, Douglas - WCLIB Rules, Standard.
 3. Fir, White - WCLIB Rules, Standard.
 4. Pine, Western White* - WWPA Rules, Standard.

5. Pine, Southern Yellow – SPA and SPIB Rules (KD), No. 2 Common.
* Includes Idaho, Lodgepole, Ponderosa, and Sugar Pine.
- B. Lumber, except where otherwise noted, shall be surfaced 4 sides unless, in addition to being dressed, it has been notched, shiplapped, or patterned.
- C. Dimensions of lumber specified or called for by the Drawings are nominal.

2.2 WOOD PRESERVATION TREATMENT

- A. Wood framing and installed on or above the roof deck shall be pressure treated as called for by the published Standards of the American Wood Preserver's Association (AWPA), and the following:
 1. Moisture content of lumber at time of treatment shall not be more than 30 percent, except that Douglas Fir may be treated green if it does not have a high percentage of sapwood.
 2. Preservative used for treating lumber to be painted or which will come in contact with finish materials shall be paintable type.
 3. All treated lumber shall be suitably identified as to name of treater, preservative used, and retention of preservative in lbs. per cubic foot of lumber.
 4. All lumber shall be seasoned after treatment to the moisture content required for non-treated lumber.

2.3 PLYWOOD

- A. Identification Requirements
 1. Each panel shall be identified with the appropriate trademark of the APA – The Engineered Wood Association and shall meet the requirements of the latest edition of U.S. Product Standard PS-1 or APA PRP-108 Performance Standards.
 2. All panels which have an edge or surface permanently exposed to the weather shall be classified Exterior.
 3. Panel thickness, grade, and Group number or Span Rating shall be as shown on the Drawings.
 4. Application shall be in accordance with recommendations of the APA – The Engineered Wood Association.
- B. Preservative-Treated Plywood
 1. Treated plywood for use in roof construction or other exterior use shall be pressure-treated in accordance with AWPA Standard C9 with water-borne preservatives, as required for above ground exposure.
 2. Plywood treated with water-borne preservatives shall be dried after treatment to a moisture content of 18 per cent or less.

2.4 ROUGH HARDWARE

- A. Rough hardware needed for the proper installation of all carpentry work shall be provided. Nails, spikes, screws, bolts, and similar items shall be of proper types and ample sizes to fasten and hold the various members securely in place.

2.5 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation as indicated on the Drawings, shall be new, suitable for the intended use, and subject to the approval of the Architect.

PART 3 - EXECUTION

3.1. WORKMANSHIP

- A. All rough carpentry shall produce joints true, tight, and well nailed. Wood framing, furring, stripping, and blocking shall be laid out, installed and fitted as required by the conditions encountered. All work shall be plumbed, leveled and braced with sufficient nails, spikes, bolts, or other appropriate fasteners, to ensure secure attachment and rigidity. Any piece of work or carpentry material with a defect or defects that prevent it from serving its intended purpose satisfactorily, including crooked, warped, bowed, or otherwise defective material, even if within the limits of grade specified, will be rejected and shall be replaced with an acceptable piece.

END OF SECTION 061000

SECTION 064020 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Wood cabinets (millwork).
 - 2. Cabinet tops (countertops).
 - 3. Cabinet and miscellaneous hardware.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Section 061000 – ROUGH CARPENTRY for furring, blocking, and other carpentry work that is not exposed to view.

1.3 REFERENCE STANDARDS

- A. American National Standard Institute (ANSI)/Builders Hardware Manufacturers Association (BHMA):
 - 1. **ANSI/BHMA A156.9** – Cabinet Hardware.
 - 2. **ANSI/BHMA A156.18** – Materials and Finishes.
 - 3. **ANSI A208.2** – Medium Density Fiberboard (MDF) for Interior Applications.
- B. American National Standards Institute (ANSI)/Hardwood Plywood & Veneer Association (HPVA):
 - 1. **ANSI/HPVA HP-1-2020** – American National Standard for Hardwood Decorative Plywood.
- C. Federal Specifications (FS):
 - 1. **FS FF-N-105** – Nails, Brads, Staples and Spikes: Wire, Cut and Wrought
 - 2. **FS FF-S-111** – Screw, Wood.
- D. National Electrical Manufacturers Association (NEMA):
 - 1. **NEMA LD3** – High-Pressure Decorative Laminate (HPDL).
- E. U.S. Department of Commerce Product Standard (PS):
 - 1. **PS1-95** – Construction and Industrial Plywood.

- F. Architectural Woodwork Institute (AWI).
- G. The Engineered Wood Association (APA):
 - 1. **APA PS-1** – U. S. Plywood Standard.
- H. Architectural Woodwork Institute (AWI)/Architectural Woodwork Manufacturers Association of Canada (AWMAC) Quality Standards Illustrated (QSI).

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Specification Section 013300 – SUBMITTAL PROCEDURES.
- B. Product data for each type of product and process specified in this section and incorporated into items of architectural woodwork during fabrication, finishing, and installation.
- C. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
- D. Samples for initial selection purposes of the following in form of manufacturer's color charts consisting of actual units or sections of units showing full range of colors, textures, and patterns available for each type of material indicated on the Drawings.
 - 1. Plastic laminate.
 - 2. Quartz Surfacing.
 - 3. Solid Surfacing.
- E. Samples for verification purposes of the following:
 - 1. Exposed cabinet hardware, one unit of each type and finish.
- F. Product certificates signed by woodwork manufacturer certifying that products comply with specified requirements.
- G. Qualification data for firms and persons specified in "Quality Assurance" article of this section to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, and other information specified.

1.5 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** Firm experienced in successfully producing architectural woodwork similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the Work.
- B. **Single-Source Manufacturing and Installation Responsibility:** Engage a qualified Manufacturer to assume undivided responsibility for woodwork specified in this section, including fabrication, finishing, and installation.

- C. Installer Qualifications: Arrange for installation of architectural woodwork by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this project.
- D. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI) except as otherwise indicated.
- E. Work in this section shall comply with **Custom Grade** quality standards and applicable sections of the current edition of AWI/AWMAC Quality Standards Illustrated (QSI).

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect architectural woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- B. Do not deliver architectural woodwork until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate architectural woodwork have been completed in installation areas. If architectural woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions."

1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Obtain and comply with Woodwork Manufacturer's and Installer's coordinated advice for optimum temperature and humidity conditions for architectural woodwork during its storage and installation. Do not install architectural woodwork until these conditions have been attained and stabilized so that architectural woodwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.
- B. Field Measurements: Where architectural woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before manufacturing architectural woodwork; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of Work.

PART 2 - PRODUCTS

2.1 HIGH PRESSURE DECORATIVE LAMINATE MANUFACTURERS

- A. Basis of Design Manufacturers: Subject to compliance with requirements, manufacturers offering high pressure decorative laminates which may be incorporated in the Work include but are not limited to the following:
 - 1. Wilsonart® by Wilsonart LLC, Temple, TX.
- B. Refer to Drawing Sheet A-402 – MILLWORK & INTERIOR ELEVATIONS for laminate locations and types.

2.2 QUARTZ SURFACE FABRICATION MANUFACTURERS

- A. Basis of Design Manufacturers: Subject to compliance with requirements, manufacturers offering solid surface and quartz fabrications which may be incorporated in the Work include but are not limited to the following:
 - 1. Quartz Surface: MSI Surfaces, www.msisurfaces.com.
- B. Refer to Drawing Sheet A-402 – MILLWORK & INTERIOR ELEVATIONS for laminate locations and types.

2.3 MATERIALS

- A. General: Provide materials that comply with requirements of the AWI woodworking standard for each type of architectural woodwork and quality grade indicated and, where the following products are part of architectural woodwork, with requirements of the referenced product standards, that apply to product characteristics indicated:
 - 1. Medium Density Fiberboard: ANSI A208.2.
 - 2. Softwood Plywood: PS 1.
 - 3. Melamine Surfacing: NEMA LD3.
 - 4. Hardwood Plywood – APA PS-1, ANSI/HPVA HP-1.
 - 5. Medium Density Overlay (MDO): APA PS-1.

2.4 FABRICATION, GENERAL

- A. Typical Cabinet Construction shall consist of medium density fiber board (MDF) with plastic laminate veneer at all exposed surfaces including door and drawer edges. Interior of cabinets (semi-exposed) surfaces shall be veneered with melamine. Wall cabinets are to be 1'-1" clear inside – typical.
- B. Fabricate architectural woodwork to dimensions, profiles, and details indicated on the Drawings. Ease edges to radius indicated for the following:
 - 1. Corners of cabinets and edges of solid wood (lumber) members less than 1 inch in nominal thickness: 1/16 inch.
 - 2. Edges of rails and similar members more than 1 inch in nominal thickness: 1/8 inch.
- C. Complete fabrication, including assembly, finishing, and hardware application, before shipment to project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- D. Factory-cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges of cutouts with a water-resistant coating.

- E. Quality Standard: Comply with AWI Section 400 and its Division 400A "Wood Cabinets": Custom Grade.
- F. AWI Type of Cabinet Construction: Flush overlay.

2.5 CABINET HARDWARE AND ACCESSORY MATERIALS

- A. Cabinet Hardware Schedule: Refer to schedule at end of this section for cabinet hardware required for architectural cabinets.
- B. Hardware Standard: Comply with ANSI/BHMA A156.9 "American National Standard for Cabinet Hardware" for items indicated by reference to BHMA numbers or referenced to this standard.
- C. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for BHMA code number indicated.
- D. For concealed hardware provide manufacturer's standard finish that complies with product class requirements of ANSI/BHMA A156.9.

2.6 ARCHITECTURAL CABINET TOPS (COUNTERTOPS)

- A. Quality Standard: Comply with AWI Section 400 and its Division 400C.
- B. High pressure decorative laminate countertops shall comply with the following:
 - 1. Grade: Premium.
 - 2. Laminate Cladding for Horizontal Surface: High pressure decorative laminate as follows:
 - a. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1) Provide selections made by Architect from manufacturer's full range of standard colors and finishes in the following categories:
 - a) Solid colors.
 - b) Wood grains.
 - c) Patterns.
 - b. Grade: GP-50 (0.050-inch nominal thickness).
 - c. Grain Direction: Parallel to longest dimension.
 - 3. Edge Treatment: Same as laminate cladding on horizontal surfaces.

2.7 FASTENERS AND ANCHORS

- A. Screws: Select material, type, size, and finish required for each use. Comply with FS FF-S-111 for applicable requirements.
 - 1. For metal framing supports, provide screws as recommended by metal framing manufacturer.
- B. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
- C. Anchors: Select material, type, size, and finish required by each substrate for secure anchorage. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts and anchors, as required, to be set into concrete or masonry work for subsequent architectural woodwork anchorage.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition architectural woodwork to average prevailing humidity conditions in installation areas before installing.
- B. Deliver concrete inserts and similar anchoring devices to be built into substrates well in advance of time substrates are to be built.
- C. Before installing architectural architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

3.2 INSTALLATION

- A. Quality Standard: Install architectural woodwork to comply with AWI Section 1700 for same grade specified in Part 2 of this section for type of architectural woodwork involved.
- B. Install architectural woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 8'-0" for plumb and level (including tops) and with no variations in flushness of adjoining surfaces.
- C. Scribe and cut architectural woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- D. Anchor architectural woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fastener heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with architectural woodwork and matching final finish where transparent finish is indicated.

- E. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated. Maintain veneer sequence matching (if any) of cabinets with transparent finish.
- F. Tops: Anchor securely to base units and other support systems as indicated.

3.3 ADJUSTMENT AND CLEANING

- A. Repair damaged and defective architectural woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace architectural woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean architectural woodwork on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.4 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensures that architectural woodwork is not damaged or deteriorated at time of Substantial Completion.

3.5 HARDWARE SCHEDULE

- A. Refer to Drawings for scope of cabinet Work, Hardware, and specific details. Submit product data for all cabinet hardware items furnished and installed. Provide cabinet hardware as follows (Note: Not all hardware items listed may be used):
 1. Concealed Hinges: All metal, nickel plated, concealed, self-closing, with three-dimensional adjustment and 120 degree opening angle – Blum® 71T5580 Clip Top 120 degree or Blum® 73T5580 Clip Top 120 degree as manufactured by Blum, Inc., Stanley, NC, www.blum.com or approved equivalent.
 2. Drawer & Door Pulls: Satin chrome wire pull, 4” hole spacing x 1-1/4” high x 5/16” diameter – Berenson™ 6130-2SC-P as manufactured by Berenson™ Cabinet Hardware, Buffalo, NY, www.berensonhardware.com or approved equivalent.
 3. Drawer Slides: Soft Close, Steel, full-extension, ball-bearing for medium duty applications, 100 lb. load capacity, side mount, 1-13/16 inch height – Knapé & Vogt, Model #8450FM, Soft-Close, Sidemount Drawer Slide with Force Management Technology, Knapé & Vogt, 2700 Oak Industrial Drive NE, Grand Rapids, Michigan, Phone (616) 459-3311 (800-253-1561), www.kb.com, or approved equivalent.
 4. Shelf Standards & Supports: Surface mounted or flush mortise-recessed, 5/8” wide x 3/16” deep steel standards with 1/2” vertical slot adjustability, zinc color - KV#255 ZC with KV #256 ZC steel shelf support clips as manufactured by Knapé & Vogt Manufacturing Company, Grand Rapids, MI, www.knapéandvogt.com or approved equivalent.

5. Shelf Supports: No. 1F711NP spoon-shaped, press-in style for 5mm bore, 3/8" long x 5/16" wide shelf rest area, nickel plated steel as distributed by Wurth Baer Supply Company, Vernon Hills, IL, www.baersupply.com or approved equivalent.
6. Cord Grommet: 3" diameter slotted plastic cap and sleeve for 2-1/2" diameter hole, black, No. BMI-1031BK as manufactured by Bainbridge Manufacturing, Inc., Waterville, WA, www.bainbridgemfg.com or approved equivalent.
7. Trash Grommet: Mockett TM10B – 10 inch diameter x 3-inch deep stainless steel trash grommet as manufactured by Doug Mockett & Company, Inc., Manhattan Beach, CA, www.mockett.com or approved equivalent. Furnish and install in countertop locations as shown on the Drawings.
8. Z-Clip: Pair of 0.115" thick x 1-1/4" high x 2" long interlocking aluminum clips for hanging wall panels and cabinets, pre-cut and punched, No. E-7389 EAGLE-CLIP "Z" Clips as manufactured by Eagle Mouldings, Inc., Loretto, MN, www.eagle-aluminum.com, or approved equivalent.
9. Metal Support Bracket: 1/8" steel, "L" shaped bracket for workstation and countertop support, 1000 lbs. minimum load capacity, with pre-punched mounting flanges and 3" x 3" 45 degree notch for wall cleat or wire/cable routing, black powder coat finish, as manufactured by A&M Hardware, Inc., Mount Joy, PA, www.aandmhardware.com or approved equivalent.
10. Drawer & Door Bumper: Self-adhesive, clear plastic, 1/2-inch diameter (12.7mm) x 1/8" high (3.5mm) bumpers, No. SCB02 as distributed by ROK™ Hardware, Irvine, CA, www.rokhardware.com, or approved equivalent. Furnish and install on all drawers and cabinet doors.
11. Wardrobe Closet Rod: 1-1/16" diameter x 0.087" wall thickness x length as required, heavy duty round steel core rod with stainless steel finish wrap, Series 660 SS as manufactured by Knape & Vogt Manufacturing Co., Grand Rapids, MI, www.kv.com, or approved equivalent.
12. Wardrobe Closet Rod Flanges: Commercial closed wall-mount flange, chrome finish, No. 734 CHR as manufactured by Knape & Vogt Manufacturing Co., Grand Rapids, MI, www.kv.com, or approved equivalent. Provide two flanges per closet rod.
13. Cabinet Locks: Furnish and install disc tumbler locks on hinged cabinet doors and drawers where indicated on the Drawings.
 - a. Disc tumbler lock shall be National Disc Tumbler Cylinder Cam Lock No. NCL-C8053-C413A-14A, Nickel finish, as manufactured by CompX® National Cabinet Lock, Greenville, SC, www.compx.com, or approved equivalent.
 - b. All locks shall be keyed alike except where noted to be keyed separately.

END OF SECTION 064020

SECTION 071325 - SELF-ADHERING SHEET WATERPROOFING

PART 1 — GENERAL

1.1 RELATED DOCUMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

1.2 SUMMARY

- A. The work of this section includes, but is not limited to, the following materials for waterproofing new concrete retaining walls, in locations as shown on the Drawings.
 - 1. Rubberized asphalt sheet membrane waterproofing.
 - 2. Primer and liquid membrane.
 - 3. Protection board.
- B. Related Sections: Other specification sections which directly relate to the work of this section include, but are not limited to, the following:
 - 1. Section 033000 – CAST-IN-PLACE CONCRETE.
 - 2. Section 072100 – BUILDING INSULATION.

1.3 REFERENCE STANDARDS

- A. The following standards and publications are applicable to the extent referenced in the text.
- B. American Society for Testing and Materials (ASTM):
 - 1. **C 836** Standard Specification for High Solids, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
 - 2. **D 412** Standard Test Methods for Rubber Properties in Tension.
 - 3. **D 570** Standard Test Method for Water Absorption of Plastics.
 - 4. **D 882** Standard Test Methods for Tensile Properties of Thin Plastic Sheeting.
 - 5. **D 1876** Standard Test Method for Peel Release of Adhesives (T-Peel).
 - 6. **D 1970** Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - 7. **D 3767** Standard Practice for Rubber - Measurements of Dimensions.
 - 8. **D 5385** Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes.
 - 9. **E 96** Standard Test Methods for Water Vapor Transmission of Materials.

10. **E 154** Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, installation instructions, use limitations and recommendations. Include certification of data indicating VOC (Volatile Organic Compound) content of all components of waterproofing system.
- B. Samples: Submit representative samples of the following for approval:
 - 1. Sheet membrane.
 - 2. Protection board.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Sheet membrane waterproofing shall be manufactured and marketed by a firm with a minimum of 20 years' experience in the production and sales of self-adhesive sheet membrane waterproofing. Manufacturers proposed for use but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past 5 years. Refer to Section 012500 – SUBSTITUTION PROCEDURES.
- B. Installer: A firm which has at least 3 years' experience in work of the type required by this section.
- C. Materials: For each type of material required for the work of this section, provide primary materials which are the products of one manufacturer.
- D. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Agenda for meeting shall include review of special details and flashing.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in labeled packages. Store and handle in strict compliance with manufacturer's instructions, recommendations and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.
 - 1. Do not double-stack pallets of membrane on the job site. Provide cover on top and all sides, allowing for adequate ventilation.
 - 2. Protect mastic and adhesive from moisture and potential sources of ignition.
 - 3. Store protection board flat and off the ground. Provide cover on top and all sides.
- B. Sequence deliveries to avoid delays, but minimize on-site storage.

1.7 PROJECT CONDITIONS

- A. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials and products used.
- B. Proceed with installation only when substrate construction and preparation work is complete and in condition to receive sheet membrane waterproofing.

1.8 WARRANTY

- A. Sheet Membrane Waterproofing: Provide written 5 year material warranty issued by the membrane manufacturer upon completion of the work.
- B. Installation Warranty: Provide written two (2) year installer's warranty covering all labor and materials necessary to make system watertight.

PART 2 — PRODUCTS

2.1 MATERIALS

- A. Sheet Membrane Waterproofing – Basis of Design: Bituthene® 3000 Membrane by GCP Applied Technologies; a self-adhesive, cold-applied composite sheet consisting of a thickness of 1.4 mm (0.056 in.) of rubberized asphalt and 0.1 mm (0.004 in.) of cross-laminated, high density polyethylene film. Provide rubberized asphalt membrane covered with a release sheet, which is removed during installation. No special adhesive or heat shall be required to form laps.
- B. Sheet Membrane Waterproofing Properties:

PHYSICAL PROPERTIES FOR BITUTHENE 3000 MEMBRANE:

Property	Test Method	Typical Value
Color		Dark gray-black
Thickness	ASTM D 3767 Method A	1.5 mm (0.060 in.) nominal
Flexibility, 180° bend over 25 mm (1 in.) mandrel at -43°C (-45°F)	ASTM D 1970	Unaffected
Tensile Strength, Membrane Die C	ASTM D 412 Modified ¹	2240 kPa (325 lbs/in. ²) minimum
Tensile Strength, Film	ASTM D 882 Modified ¹	34.5 MPa (5,000 lbs/in. ²) minimum
Elongation, Ultimate Failure of Rubberized Asphalt	ASTM D 412 Modified ¹	300% minimum
Crack Cycling at -32°C (-25°F), 100 Cycles	ASTM C 836	Unaffected
Lap Adhesion at Minimum Application Temperature	ASTM D 1876 Modified ²	700 N/m (4 lbs/in.) – Bituthene 3000 880 N/m (5 lbs/in.) – Low Temp

Property	Test Method	Typical Value
Puncture Resistance, Membrane	ASTM E 154	222 N (50 lbs) minimum
Resistance to Hydrostatic Head	ASTM D 5385	60 m (200 ft) of water
Permeance	ASTM E 96, Section 12 – Water Method	2.9 ng/m ² sPa (0.05 perms) maximum
Water Absorption	ASTM D 570	0.1% maximum

Footnotes:

1. *The test is run at a rate of 50 mm (2 in.) per minute.*
 2. *The test is conducted 15 minutes after the lap is formed and run at a rate of 50 mm (2 in.) per minute at -4°C (25°F).*
 3. *The 180° peel strength is run at a rate of 300 mm (12 in.) per minute.*
- C. Alternate Manufacturers: Similar waterproofing systems by Carlisle, W.R. Meadows, and Polyguard are acceptable providing the waterproofing system meets or exceeds properties of the Basis of Design system specified.
- D. Extruded Polystyrene (XPS) Protection Board – Basis of Design: FOAMULAR® 250 XPS by Owens Corning Foam Insulation, LLC, Toledo, OH. 38 mm (1-1/2 inch) thick, R7.5, for vertical applications as specified. Refer to Section 072100 – BUILDING INSULATION.
- E. Miscellaneous Materials
1. Primer – Basis of Design: Bituthene® Primer B2 by GCP Applied Technologies.
 2. Liquid Membrane – Basis of Design: Bituthene® Liquid Membrane by GCP Applied Technologies.
 3. Miscellaneous Materials: Surface conditioner, mastic, tape, and other accessories specified or acceptable to manufacturer of sheet waterproofing system.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 PREPARATION OF SUBSTRATES

- A. Refer to manufacturer’s literature for requirements for preparation of substrates. Surfaces shall be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods which are acceptable to manufacturer of sheet membrane waterproofing.

B. Cast-In-Place Concrete Substrates:

1. Do not proceed with installation until concrete has properly cured and dried (minimum 7 days for normal structural concrete). If time critical, Bituthene® Primer B2 may be used to allow priming and installation of membrane sooner than 7 days. Priming may begin in this case as soon as the concrete will maintain structural integrity.
2. Fill form tie rod holes with concrete and finish flush with surrounding surface.
3. Repair bugholes over 13 mm (0.5 in.) in length and 6 mm (0.25 in.) deep and finish flush with surrounding surface.
4. Remove scaling to sound, unaffected concrete and repair exposed area.
5. Grind irregular construction joints to suitable flush surface.

C. Related Materials: Treat joints and install flashing as recommended by waterproofing manufacturer.

3.3 INSTALLATION

A. Refer to manufacturer's literature for recommendations on installation, including but not limited to, the following:

1. Apply primer at rate recommended by manufacturer. Recoat areas not waterproofed if contaminated by dust. Mask and protect adjoining exposed finish surfaces to protect those surfaces from excessive application of primer.
2. Delay application of membrane until primer is completely dry. Dry time will vary with weather conditions.
3. Seal daily terminations with troweled bead of mastic.
4. Apply protection board and related materials in accordance with manufacturer's recommendations.

3.4 CLEANING AND PROTECTION

- A. Remove any masking materials after installation. Clean any stains on materials which would be exposed in the completed work.
- B. Protect completed membrane waterproofing from subsequent construction activities as recommended by manufacturer.

END OF SECTION 071325

SECTION 072100 - BUILDING INSULATION

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes furnishing and installing fiberglass batt insulation for thermal and acoustical control and continuous rigid insulation in locations as shown on the Drawings.
- B. Related Sections
 - 1. Section 079200 – JOINT SEALANTS: Spray foam insulating sealant.
 - 2. Section 092216 – NON-STRUCTURAL METAL FRAMING: Metal stud framing for interior partitions.

1.2 PERFORMANCE CHARACTERISTICS

- A. Thermal resistivity or "r-value" represents the reciprocal of thermal conductivity (k-value), which is the rate of heat flow through a homogenous material exactly 1 inch thick. Thermal resistivities are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one sq. ft. per hour at mean temperatures indicated.
- B. Fire Performance Characteristics: Provide insulation materials identical to those whose indicated fire performance characteristics have been determined per ASTM E 119, ASTM E 84, and ASTM E 136, as applicable, by Underwriters Laboratories (UL) or other testing and inspecting organizations acceptable to Authorities Having Jurisdiction (AHJ). Identify products with appropriate markings of applicable testing and inspecting organizations.

1.3 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. **ASTM C203** – Standard Test Method for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.
 - 2. **ASTM C272** – Standard Test Method for Water Absorption of Core Materials for Sandwich Construction.
 - 3. **ASTM C518** - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 4. **ASTM C578** – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - 5. **ASTM C665** – Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - 6. **ASTM C1338** - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
 - 7. **ASTM D1621** – Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 - 8. **ASTM E84** - Standard Test Method for Surface Burning Characteristics of Building Materials.

9. **ASTM E96** - Standard Test Method for Water Vapor Transmission of Materials.
10. **ASTM E119** - Standard Test Methods for Fire Tests of Building Construction and Materials.
11. **ASTM E136** - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.

1.4 SUBMITTALS

- A. Submit product data for each form and type of insulation indicated.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Unfaced Fiberglass Batt Acoustical Insulation: Basis of Design: 3-1/2" Owens Corning™ EcoTouch® PINK® FIBERGLAS™ Insulation with PureFiber® Technology, noncombustible, mold and mildew resistant, unfaced fiberglass batts for thermal and acoustical control as manufactured by Owens Corning Insulating Systems, LLC, or approved equivalent. Install as per manufacturer's recommendations in interior partitions as shown on the Drawings. Physical properties and test methods as follows:
 1. Classification Type per ASTM C665: Type I, Class A.
 2. Flame Spread/Smoke Developed per ASTM E84: 25/50.
 3. Fungi Resistance per ASTM C1338: Mold/mildew resistant.
 4. Flammability Rating per ASTM E136: Noncombustible.
 5. Thermal Resistance per ASTM C518: 3-1/2" = R13; 6-1/4" = R19.

- B. Spray Foam Insulating Sealant: For insulating boxed header metal stud framing at window and door openings and for insulating penetrations and internal cavities of exterior wall construction in locations as shown on the Drawings. Refer to Section 079200 – JOINT SEALANTS, paragraph 2.3.E for Basis of Design product.

- C. Rigid Insulation for Slab Edge and Foundation Walls: Basis of Design – FOAMULAR® 250 XPS (Extruded Polystyrene) Insulation board by Owens Corning Foam Insulation, LLC, Toledo, OH. Furnish and install at perimeter concrete slab edges and foundation walls in locations as shown on the Drawings. Insulation shall have the following characteristics:
 1. Thickness: 1-1/2 inch (38 mm).
 2. Classification (ASTM C578): Type IV.
 3. Compressive Strength (ASTM D1621): 25 PSI minimum.
 4. Minimum Density: 1.55 PCF.
 5. Thermal Resistance, 1-inch thickness (ASTM C518): R 5.0.
 6. Flexural Strength (ASTM C203): 50 PSI minimum.
 7. Water Vapor Permeance, 1-inch thickness (ASTM E96): 1.5 perm
 8. Water Absorption (ASTM C272): 0.3 max. % by volume.
 9. Flame Spread (ASTM E84): 10.
 10. Smoke Developed (ASTM E84): 175.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with insulation manufacturer's instructions for installation of insulation.
- B. Support insulation units by adhesive or mechanical anchorage or both as applicable to location and conditions indicated.

END OF SECTION 072100

SECTION 072615 - UNDERSLAB VAPOR RETARDER (15 MIL)

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Application of an underslab vapor retarder in locations as shown on the Drawings.

1.2 RELATED SECTIONS

- A. Section 033000 – CAST-IN-PLACE CONCRETE.

1.3 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. **ASTM E1745** - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil Or Granular Fill Under Concrete Slabs.
 - 2. **ASTM E154** - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs.
 - 3. **ASTM E96** - Standard Test Methods for Water Vapor Transmission of Materials.
 - 4. **ASTM E1643** - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
 - 5. **ASTM F1249-01** - Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor.
 - 6. **ASTM D1709** – 15a Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
- B. American Concrete Institute (ACI):
 - 1. **ACI 302.1R-96** - Vapor Barrier Component (plastic membrane) is not less than 10 mils thick.

1.4 SUBMITTALS

- A. Submit manufacturer's product data and application instructions.

1.5 QUALITY ASSURANCE

- A. Use an experienced installer and adequate number of skilled personnel who are thoroughly trained and experienced in the application of the vapor retarder.
- B. Obtain vapor retarder materials from a single manufacturer regularly engaged in manufacturing the product.
- C. Provide products which comply with all state and local regulations controlling use of volatile organic compounds (VOCs).

1.6 PRE-INSTALLATION MEETING

- A. Convene a pre-installation meeting one week prior to installation of underslab vapor retarder. Suggested attendees: Architect, Contractor, Vapor Retarder installer, and Vapor Retarder manufacturer representative to discuss the installation in detail.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Store materials in a clean dry area in accordance with manufacturer's instructions.
- C. Stack membrane on smooth ground or wood platform to eliminate warping.
- D. Protect materials during handling and application to prevent damage or contamination.
- E. Ensure membrane is stamped with manufacturer's name, product name and membrane thickness at intervals of no more than 85" (220 cm).

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Product not intended for uses subject to abuse or permanent exposure to the elements.
- B. Do not apply on frozen ground.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: W.R. Meadows, Inc., PO Box 338, Hampshire, Illinois 60140-0338. (800) 342-5976. (847) 683-4500. Fax (847) 683-4544. Web Site www.wrmeadows.com.

2.2 MATERIALS

- A. Plastic Vapor Retarder
 - 1. Vapor retarder membrane shall be manufactured from virgin polyolefin resins, and when tested according to all requirements of ASTM E 1745, shall meet the following minimum performance requirements:
 - a. Maximum Water Vapor Permeance (ASTM E 154, Sections 7, 8, 11, 12, 13; by ASTM E 96, Method B; or ASTM F 1249).
 - 1) As received: 0.0063 perms.
 - 2) After wetting and drying: 0.0052 perms.
 - 3) Resistance to Plastic Flow and Temperature: 0.0057 perms.
 - 4) Effect Low Temperature and Flexibility: 0.0052 perms.
 - 5) Resistance to Deterioration from Organisms and Substances in Contacting Soil: 0.0052 perms.

- b. Puncture Resistance (ASTM D 1709): > 3,200 grams.
- c. Tensile Strength (ASTM E 154, Section 9): 72 lb. force/inch.
- d. Water Vapor Retarder (ASTM E 1745): Meets or exceeds Class A, B, and C.
- e. Thickness of Retarder (plastic) (ACI 302.1R-96): Not less than 10 mils.

B. Proprietary Specification – Basis of Design:

- 1. Perminator™ 15 mil by W.R. Meadows, Inc.
- 2. Stego®Wrap - 15 mils by Stego Industries, LLC, acceptable alternate.
- 3. Or approved equivalent.

2.3 ACCESSORIES

A. Seam Tape

- 1. High Density Polyethylene Tape with pressure sensitive adhesive. Minimum width 4 inches.
 - a. Basis of Design: Perminator Tape by W.R. Meadows, Inc., or approved equivalent.

B. Pipe collars

- 1. Construct pipe collars from vapor retarder material and pressure sensitive tape per manufacturer's instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive membrane. Notify Architect if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Prepare surfaces in accordance with manufacturer's instructions.
- B. Level, tamp, or roll earth or granular material beneath the slab base.

3.3 APPLICATION

- A. Installation shall be in accordance with manufacturer's instructions and ASTM E 1643–98.
- B. Unroll vapor retarder with the longest dimension parallel with the direction of the pour.
- C. Lap vapor retarder over footings and seal to foundation walls.
- D. Overlap joints 6 inches and seal with manufacturer's tape.

- E. Seal all penetrations (including pipes) with manufacturer's pipe boot.
- F. No penetration of the vapor retarder shall be allowed except for reinforcing steel and permanent utilities.
- G. Repair damaged areas by cutting patches of vapor retarder, overlapping damaged area 6 inches and taping all four sides with tape.

END OF SECTION 072615

SECTION 075423 – SINGLE PLY ROOFING SYSTEM (TPO)

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish and install a complete fully-adhered TPO roofing system, including:
 - 1. Roofing Manufacturer’s requirements for the specified warranty.
 - 2. Preparation of roof substrates.
 - 3. Treated wood nailers for roofing attachment.
 - 4. Rigid polyisocyanurate insulation, adhesive attached.
 - 5. Tapered polyisocyanurate insulation for roof slopes and roof crickets, adhesive attached.
 - 6. Roof cover board, adhesive attached.
 - 7. Fully adhered TPO elastomeric membrane roofing and flashings.
 - 8. Other roofing related items specified or indicated on the Drawings or otherwise necessary to provide a complete weatherproof roofing system.
- B. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations. Refer to Section 017419 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
- C. Comply with the published recommendations and instructions of the roofing membrane Manufacturer, at <http://Holcimelevate.com> .
- D. Commencement of work by the Contractor shall constitute acknowledgement by the Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing membrane Manufacturer. No modification of the Contract Sum will be made for failure to adequately examine the Contract Documents or the project conditions.
- E. Refer to Structural Drawings, Sheet S001 – GENERAL NOTES for wind load information affecting roof components.

1.2 RELATED SECTIONS

- A. Section 053100 – STEEL DECK: Steel roof deck.
- B. Section 061000 – ROUGH CARPENTRY: Treated wood nailers associated with roofing installation.
- C. Section 076200 – SHEET METAL FLASHING AND TRIM: Miscellaneous formed metal flashing and trim items associated with roofing.

1.3 REFERENCE STANDARDS

- A. Definitions in the current additions of ASTM D1079 and National Roofing Contractors Association (NRCA) “The NCRA Roofing Manual: Membrane Roof Systems” apply to the work of this section.

- B. Referenced Standards: The following standards form part of this specification only to the extent they are referenced as specification requirements.
- C. American Society for Testing and Materials (ASTM):
1. **ASTM C473** – Standard Test Methods for Physical Testing of Gypsum Panel Products.
 2. **ASTM C518** – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 3. **ASTM C1177** – Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 4. **ASTM C1289** – Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 5. **ASTM D1079** – Standard Terminology Relating to Roofing and Waterproofing.
 6. **ASTM D6878** – Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing.
 7. **ASTM E84** – Standard Test Method for Surface Burning Characteristics of Building Materials.
 8. **ASTM E96** – Standard Test Methods for Water Vapor Transmission of Materials.
 9. **ASTM E661** – Standard Test Method for Performance of Wood and Wood-Based Floor And Roof Sheathing Under Concentrated Static and Impact Loads.
- D. Factory Mutual (FM):
1. **FM 4470** – Single Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for Use in Class 1 and Non-Combustible Roof Deck Construction.
- E. US Voluntary Product Standard (PS):
1. **PS-1** – Construction and Industrial Plywood; 1995.
 2. **PS-20** – American Softwood Lumber Standard; 2005.
- F. Underwriters Laboratories (UL).
- G. International Organization of Standardization (ISO):
1. **ISO 9001** – Quality Management Systems (QMS).
- H. American Society for Civil Engineers (ASCE):
1. **ASCE 7-16** – Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

1.4 SUBMITTALS

- A. Product Data:

1. Provide membrane Manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane Manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.
 2. Where UL or FM requirements are specified, provide documentation that shows that the roofing system to be installed is UL-Classified or FM-approved, as applicable. Include data itemizing the components of the classified or approved system, showing compliance with required wind uplift requirements.
 3. Installation Instructions: Provide Manufacturer's instructions to installer, marked up to show exactly how all components will be installed; where instructions allow installation options, clearly indicate which option will be used.
- B. Shop Drawings: Provide:
1. The roof membrane Manufacturer's standard details customized for this project for all relevant conditions, including flashings, base tie-ins, roof edges, terminations, expansion joints, penetrations, and drains.
- C. Pre-Installation Notice: Copy to show that Manufacturer's required Pre-Installation Notice (PIN) has been accepted and approved by the Manufacturer.
- D. Specimen Warranty: Submit prior to starting work.
- E. Samples: Submit samples of each product to be used.
- F. Closeout Submittals:
1. Executed Warranty.
 2. Maintenance Data.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: Roofing installer shall have the following:
1. Current Elevate Master Contractor status.
 2. At least five years experience in installing specified system.
 3. Capability to provide payment and performance bond to building Owner.
- B. Pre-Installation Conference: Before start of roofing work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.
1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.
 2. Review methods and procedures related to roofing installation, with special emphasis on requirements for adhesive and mechanical fastener attachment to maintain wind uplift resistance as required by ASCE 7-16, including Manufacturer's written instructions.

3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes, including flatness and fastening.
5. Review structural loading limitations on roof deck during and after roofing.
6. Review base flashings, special roof details, roofing system components, roof drainage slopes, crickets, roof penetrations, equipment curbs, and conditions of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.
10. Notify Architect well in advance of meeting.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in Manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.
- B. Store materials clear of ground and moisture with weather protective covering.
- C. Keep combustible materials away from ignition sources.
- D. Discard and legally dispose of material that cannot be applied within its stated shelf life.
- E. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck caused by structural overloading.

1.7 FIELD CONDITIONS

- A. Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed in accordance with Manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

- A. Comply with all warranty procedures required by Manufacturer, including notifications, scheduling, and inspections.
- B. Warranty: Elevate 20-Year Red Shield™ Roofing System Limited Warranty covering membrane, roof insulation, and system accessories.
 1. Limit of Liability: No dollar limitation (NDL).
 2. Scope of Coverage: Repair leaks in the roofing system caused by:
 - a. Ordinary wear and tear.
 - b. Normal exposure to the elements.
 - c. Manufacturing defect in Elevate brand materials.
 - d. Defective workmanship used to install these materials.
 - e. Damage due to winds up to 55 mph.

3. Not Covered:
 - a. Damage due to winds in excess of 55 mph.
 - b. Damage due to hurricanes or tornadoes.
 - c. Hail.
 - d. Intentional damage.
 - e. Unintentional damage due to normal rooftop inspections, maintenance, or service.

1.9 SPECIAL WARRANTY

- A. Refer to Section 076200 – SHEET METAL FLASHING & TRIM, paragraph 1.5 for special two (2) year General Contractor and Roofing Subcontractor warranty covering weathertightness of all roofing and flashing materials and installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Manufacturer - Roofing System: Elevate roofing, lining, and wall systems, Nashville, Tennessee, <http://www.holcimelevate.com>, or approved equivalent.
- B. Roofing systems manufactured by others may be acceptable provided the roofing system is completely equivalent in materials and warranty conditions and the Manufacturer meets the following qualifications:
 1. Specializing in manufacturing the roofing system to be provided.
 2. Minimum ten years of experience manufacturing the roofing system to be provided.
 3. Able to provide a No Dollar Limit (NDL), single source roof system warranty backed by corporate assets in excess of one billion dollars.
 4. ISO 9001 certified.
 5. Able to provide polyisocyanurate insulation produced in own facilities.
- C. Manufacturer of Insulation: Same Manufacturer as roof membrane.
- D. Manufacturer of Roof Cover Board: Refer to paragraph 2.5 of this section.
- E. Substitution Procedures: Refer to Section 012500 – SUBSTITUTION PROCEDURES and Section 016000 – PRODUCT REQUIREMENTS.

2.2 ROOFING SYSTEM DESCRIPTION

- A. Roofing System:
 1. Membrane: Thermoplastic Polyolefin (TPO).
 2. Thickness: 0.060 inch (60 mil).
 3. Membrane Attachment: Adhered.
 4. Slope: Provide slope of 1/4 inch per foot (1:48) (2%) by means of tapered insulation, as specified in paragraph 2.7..
 5. Comply with applicable local building code requirements.

6. Provide assembly having Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification.

B. Insulation

1. Total System R-Value: Not required for exterior canopy roof.
 - a. Maximum Board Thickness: Refer to Drawings.
 - b. Use as many layers as necessary to achieve required thickness.
 - c. Stagger joints in adjacent layers.
2. Base Layer: Polyisocyanurate foam board, non-composite.
 - a. Attachment: Low-rise polyurethane adhesive.
3. Fill Layers: Polyisocyanurate foam board, non-composite.
 - a. Attachment: Low-rise polyurethane adhesive.
4. Top Layer: Polyisocyanurate foam board, non-composite.
 - a. Attachment: Low-rise polyurethane adhesive.

D. Gypsum-Based Cover Board:

1. Thickness: ½-inch (0.50-inch, 12.7 mm).
2. Attachment: Low-rise polyurethane adhesive.

2.3 TPO MEMBRANE MATERIALS

- A. Roof and Flashing Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D 6878, with polyester weft inserted reinforcement and the following additional characteristics:
1. Thickness: 0.060-inch (60 mil, 1.52 mm).
 2. Color: White.
 3. Reinforcement: Polyester, weft-inserted scrim.
 4. Sheet Width: Use widest sheet practical for jobsite conditions to minimize field seams.
 5. Basis of Design: UltraPly™ TPO Membrane by Elevate.
- B. Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18 inches (457 mm) wide. Basis of Design: UltraPly™ TPO 18" Curb Flashing.
- C. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber.
1. Color: Same as roofing membrane.
 2. Basis of Design Product: UltraPly TPO Unsupported Flashing by Elevate.

- D. Factory-formed Weldable Flashing Accessories: UltraPly™ TPO Flashing (various) by Elevate.
- E. Self-Adhering Flashing Membrane: Unsupported (non-reinforced) TPO membrane factory laminated to white seam tape; UltraPly™ TPO Quickseam™ Flashing by Elevate.
- F. Factory-formed Self-Adhering Flashing Accessories: UltraPly™ TPO QuickSeam™ Flashing (various) by Elevate.
- G. Bonding Adhesive: Formulated for compatibility with TPO membrane and wide variety of substrate materials: UltraPly™ Bonding Adhesive by Elevate.
- H. Seam Edge Treatment: Clear polymer-based sealant, formulated for sealing exposed edges of membrane; UltraPly™ TPO Cut Edge Sealant by Elevate.
- I. Pourable Sealer: One part polyurethane; White One-Part Pourable Sealer by Elevate.
- J. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed; Water Block Seal S-20 by Elevate.
- K. Metal Plates and Strips used for Fastening Membrane and Insulation: Steel with Galvalume coating; corrosion-resistance meeting FM 4470 criteria.
- L. Termination Bars: Aluminum bars with integral caulk ledge; 1-inch (33 mm) wide by 0.10-inch (2.5 mm) thick; Termination Bar by Elevate.

2.4 ACCESSORY MATERIALS

- A. Wood Nailers: PS 20 dimension lumber, Structural Grade No. 2 or better Southern Pine, Douglas Fir; or PS 1, APA Exterior Grade plywood; pressure preservative treated.
 - 1. Width: 3-1/2 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
 - 2. Thickness: Same thickness as roof insulation.

2.5 ROOF BOARD

- A. Furnish and install fiberglass-mat faced gypsum roof board for roof cover board in locations as shown on the Drawings.
- B. Submit complete product data, Manufacturer's specifications, and installation instructions.
- C. Provide roof boards that comply with the following limits for surface burning characteristics when tested per ASTM E84:
 - 1. Flame Spread: 0.
 - 2. Smoke Developed: 0.
- D. Basis of Design: Furnish and install DensDeck® Prime Roof Board as manufactured by Georgia-Pacific Gypsum, LLC, or approved equivalent with the following characteristics:

1. Thickness: ½-inch for roof cover board:
 - a. Width: 4 feet.
 - b. Length: 8 feet.
 - c. Weight: 2.0 lbs./sq. ft.
 - d. Surface: Fiberglass mat with non-asphaltic coating.
 - e. Flexural Strength, Parallel (ASTM C473): 80 lbf, minimum.
 - f. Compressive Strength (ASTM C473): 900 psi nominal.
 - g. Flute Span (ASTM E661): 5- inches.
 - h. Permeance (ASTM E96): greater than 23 perms.
 - i. R-Value (ASTM C518): 0.56.
 - j. Water Absorption (ASTM C1177): 5% maximum.
 - k. Surface Water Absorption (ASTM C473): 1.0 grams nominal.

- E. Adhere and mechanically attach as recommended by roof system Manufacturer and adhesive Manufacturer to meet Factory Mutual (FM) or Underwriter’s Laboratory (UL) guidelines for wind uplift resistance.

- F. Follow current Georgia Pacific LLC “Product Catalog” for installation recommendations.

- G. Protect gypsum roof board installations from damage and deterioration until the date of Substantial Completion.

2.7 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with glass reinforced mat laminated to faces, complying with ASTM C 1289 Type II Class 1, with the following additional characteristics:
 1. Thickness Basis of Design: As shown on the Drawings.
 2. Size: 48-inch (1.22 m) by 48-inch (1.22 m) nominal if adhesive attached (adhered).
 3. R-Value – Long Term Thermal Resistance (LTTR): Per inch of thickness, minimum 6.2 R at 40 deg. F (4.4 deg. C) and minimum 5.7R at 75 deg. F (23.9 deg. C).
 4. Compressive Strength: 20 psi (138 kPa).
 5. Ozone Depletion Potential: Zero, made without CFC or HCFC blowing agents.
 6. Basis of Design Product: ISOGARD GL Polyiso board insulation by Elevate.

2.8 LOW RISE FOAM ADHESIVE

- A. Two-component, low-rise polyurethane adhesive designed to attach polyisocyanurate insulation to a wide variety of acceptable substrates; Twin Jet, I.S.O.Stick™, I.S.O. Twin Pack™, or I.S.O. Spray™R by Elevate. Use adhesive as recommended by Manufacturer for project materials and substrate conditions.

2.9 METAL ACCESSORIES:

- A. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes; miters welded; injection molded EPDM splice to allow thermal expansion.

- B. Anchor Bar Cleat: 20-gage, 0.036-inch (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes.
- C. Fasteners: Factor-provided corrosion resistant fasteners, with drivers; no exposed fasteners permitted.

PART 3 - INSTALLATION

3.1 GENERAL

- A. Install roofing, insulation, flashings, and accessories in accordance with roofing Manufacturer's published instructions and recommendations for the specified roofing system. Where Manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.
- B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.
- C. Do not start work until Pre-Installation Notice has been approved by Manufacturer as confirmation that this project qualifies for Manufacturer's warranty.
- D. Perform work using competent and properly equipped personnel.
- E. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.
- F. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult Manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F (15 to 25 degrees C).
- G. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
 - 1. Protect from spills and overspray from bitumen, adhesives, sealants and coatings.
 - 2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
 - 3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.
- H. Until ready for use, keep materials in their original containers as labeled by the Manufacturer.
- I. Consult membrane Manufacturer's instructions, container labels, and Safety Data Sheets (SDS) for specific safety instructions. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

3.2 EXAMINATION

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Examine roof substrate to verify that it is properly sloped to drains.
- D. Verify that the specifications and drawing details are workable and not in conflict with the roofing Manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.

3.3 PREPARATION

- A. Take appropriate measures to ensure that fumes from adhesive solvents are not drawn into the building through air intakes.
- B. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease and other materials that may damage the membrane.
- C. Fill all surface voids in the immediate substrate that are greater than 1/4 inch (6 mm) wide with fill material acceptable insulation to membrane Manufacturer.
- D. Seal, grout, or tape deck joints, where needed, to prevent material seepage into building.

3.4 INSULATION AND COVER BOARD INSTALLATION

- A. Install insulation in configuration and with attachment method(s) specified in Part 2 – PRODUCTS, under Insulation.
- B. Install only as much insulation as can be covered with the complete roofing system before the end of the day's work or before the onset of inclement weather.
- C. Lay roof insulation in courses parallel to roof edges.
- D. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4-inch (6mm). Fill gaps greater than 1/4-inch (6 mm) with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch (6 mm).
- E. Adhesive Attachment: Apply in accordance with membrane Manufacturer's instructions and recommendations.; "walk-in" individual roof insulation boards to obtain maximum adhesive contact.

3.5 SINGLE-PLY MEMBRANE INSTALLATION

- A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.
- B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.
- C. Install membrane without wrinkles and without gaps or fishmouths in seams; bond and test seams and laps in accordance with membrane Manufacturer's instructions and details.
- D. Adhered Membrane: Bond membrane sheet to substrate using membrane Manufacturer's recommended bonding material, application rate, and procedures.
- E. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 1 in 12 inches (8.3%) using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing Manufacturer.
 - 1. Exceptions: Round pipe penetrations less than 18 inches (460 mm) in diameter and square penetrations less than 4 inches (200 mm) square.
 - 2. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing Manufacturer, and compliant with IBC.

3.6 FLASHING AND ACCESSORIES INSTALLATION

- A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane Manufacturer's recommendations and details.
- B. Metal Accessories: Install metal edgings, gravel stops, and copings in locations indicated on the Drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
 - 1. Follow roofing Manufacturer's instructions.
 - 2. Remove protective plastic surface film immediately before installation.
 - 3. Install water block sealant under the membrane anchorage leg.
 - 4. Flash with Manufacturer's recommended flashing sheet unless otherwise indicated.
 - 5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
 - 6. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, install an additional piece of self-adhesive flashing membrane over the metal lap to the top of the gravel stop; apply seam edge treatment at the intersections of the two flashing sections.
 - 7. When the roof slope is greater than 1:12 (8.3%), apply seam edge treatment along the back edge of the flashing.
- C. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, curbs, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches (200 mm) high above membrane surface.

1. Use the longest practical flashing pieces.
 2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane Manufacturer's recommendations.
 3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
 4. Provide termination directly to the vertical substrate as shown on roof drawings.
- D. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
 2. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2 inches (50 mm) deep, with at least 1 inch (25 mm) clearance from penetration, sloped to shed water.
 3. Structural Steel Tubing: If corner radii are greater than 1/4 inch (6 mm) and longest side of tube does not exceed 12 inches (305 mm), flash as for pipes; otherwise, provide a standard curb with flashing.
 4. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by Manufacturer.

3.7 FIELD QUALITY CONTROL

- A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system Manufacturer specifically to inspect installation for warranty purposes (e.g. not a salesperson).
- B. Perform all corrections necessary for issuance of warranty.

3.8 CLEANING

- A. Clean all contaminants generated by roofing work from roofing membrane, flashings, building and surrounding areas, including dirt, bitumen, adhesives, sealants, and coatings. Clean as recommended by roofing Manufacturer.
- B. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of Manufacturers of components and surfaces.
- C. Remove leftover materials, trash, debris, equipment from new roof areas, project site, and surrounding areas.

3.9 PROTECTION

- A. Where construction traffic must continue over finished roof membrane, provide durable protection and replace or repair damaged roofing to original condition.

END OF SECTION 075423

SECTION 076200 - SHEET METAL FLASHING & TRIM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Furnish and install sheet metal flashing and other sheet metal work as shown on the Drawings, as specified herein, and as required to prevent penetration of water through the roof or exterior walls of the building and permit the proper control of discharged water.

1.2 QUALITY ASSURANCE

- A. Standards: "Architectural Sheet Metal Manual", latest revision, of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA), shall be applicable minimum standard for method and quality of work under this section where flashing details are not otherwise shown on the Drawings.
- B. Qualifications of Manufacturer: Products used in the work of this Section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production to the Architect.
- C. Qualifications of Installers: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with specified requirements and methods needed for proper performance of the work of this Section.

D. Reference Standards

1. American Society for Testing and Materials (ASTM):
 - a. **ASTM A755** – Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
 - b. **ASTM B209** – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - c. **ASTM D1970** – Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
2. Society for Protective Coatings (SSPC):
 - a. **SSPC Paint 12** – Cold Applied Mastic Paint (Extra Thick Film).
3. Sheet Metal and Air Conditioning Contractors National Association (SMACNA).

1.3 SUBMITTALS

- A. General: Comply with pertinent provisions of Section 013300 – SUBMITTAL PROCEDURES.

- B. Product Data: Submit manufacturer's specifications and other product data required to demonstrate compliance with specified product requirements.
- C. Shop Drawings:
 - 1. Furnish shop drawings for approval showing fabrication details of all miscellaneous metal flashing and counterflashing as shown on the Drawings.
 - 2. Include details of horizontal and vertical seams, expansion joints, inside and outside corners, fascia and trim attachment, and flashing.
- D. Samples: Submit samples of flashing proposed for use. Provide color samples of manufacturer's standard prefinished metal flashing available. Architect will select color(s) from manufacturer's standard colors.

1.4 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect materials of this Section before, during, and after installation and to protect installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 SHEET METAL

- A. Flashing: Furnish and install all miscellaneous sheet metal flashing and counterflashing as required for flashing mechanical and electrical equipment which pass through the roof.
 - 1. Galvanized Steel: 24 gauge, unless otherwise shown, bonderized for painting meeting ASTM A755: ZincGrip® Steel with PaintGrip® zinc-phosphate coating as manufactured by Armco Steel Corporation, Middleton, OH, or approved equivalent.
 - 2. Aluminum Sheet: ASTM B209, alloy 3003-H14, 0.032 inch (20 gauge), mill finished.

2.2 CANOPY ROOF EDGE FASCIA

- A. Refer to Section 077119 – MANUFACTURED ROOF EDGE FASCIA SYSTEM.

2.3 SELF-ADHESIVE WATERPROOFING SHEET FLASHING

- A. Furnish and install as underlayment between prefinished metal roof edge fascia system and treated wood blocking at new canopy roof edge locations as shown on the Drawings.
- B. Manufacturers:
 - 1. Owens-Corning Roofing and Asphalt, LLC WeatherLock® Mat Self-Sealing Ice & Water Barrier.
 - 2. GAF WeatherWatch® XT Mat-Surfaced Leak Barrier/Water & Ice Shield.

3. IKO Industries, Ltd. "Armour Guard Ice and Water Protector" (Commercial Grade).
 4. Grace Construction Products Ice and Water Shield®.
 5. Carlisle Coatings and Waterproofing "CCW-705 Air & Vapor Barrier".
 6. TAMKO® Moisture Guard Plus®.
 7. Or approved equivalent.
- C. Submit manufacturer product data for approval. Material shall meet ASTM D1970 requirements.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Surface Conditions: Prior to all work of this Section, carefully inspect installed work of all other trades and verify that all such work is complete. Do not proceed with sheet metal installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 WORKMANSHIP

- A. General: Form all sheet metal accurately to the dimensions and shapes required. Make water and weather tight, with all angles and broken surfaces true, sharp, and straight. Where flashing intersects, cope to an accurate fit and solder securely. All flat surfaces shall be straight and free from waves and buckles.
- B. Expansion: Form, fabricate, and install all sheet metal so as to adequately provide for expansion and contraction in the finished work. Provide weathertight joint covers in copings, cap flashings and fascias at not more than 12 feet o.c.

3.3 SOLDERING

- A. General:
1. Thoroughly clean and tin all joint materials prior to soldering.
 2. Perform all soldering slowly in order to heat seams thoroughly and to permit full penetration with solder.
 3. Make all exposed soldering on finished surfaces neat, full, flowing, and smooth. Solder shall not be used where seams required a strong connection. Provide rivets at these locations, then solder watertight.
- B. Cleaning: After soldering, thoroughly wash acid flux with a soda solution.

3.4 INSTALLATION

- A. Anchor work in place with noncorrosive fasteners, adhesives, setting compounds, tapes, and other materials and devices as recommended by manufacturer of each material or system. Provide for thermal expansion and building movements. Comply with recommendations of "Architectural Sheet Metal Manual" by SMACNA.

- B. Seal moving joints in sheet metal work with elastomeric joint sealants, complying with requirements specified in Division 7, Section 079200 – JOINT SEALANTS.
- C. Clean sheet metal surfaces of soldering flux and other substances which could cause corrosion.
- D. Performance: Water-tight and weatherproof performance of all flashing and sheet metal work is required.
- E. Fabricate sheet metal with flat-lock seams; seal aluminum seams with epoxy metal seam cement and, where required for strength, rivet seams and joints.
- F. Coat back side of fabricated sheet metal with 15-mil sulfur-free bituminous coating as per SSPC – Paint 12, where required to separate metals from corrosive substrates, including cementitious materials, wood, or other absorbent materials; or provide other permanent separation.

END OF SECTION 076200

SECTION 077119 - MANUFACTURED SNAP-ON METAL FASCIA

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Furnish and install premanufactured fascia at new entry canopy roof in locations shown on the Drawings and specified herein, including all clips, sealant, fasteners, and joining to make weathertight and watertight. Components and accessories shall be factory-fabricated and supplied by a specified Manufacturer.
- B. Contractor shall utilize Manufacturer's technical representative to perform field measuring, takeoff, shop drawing development and order processing for all fascia components specified in this section.

1.2 RELATED SECTIONS

- A. Section 075423 – SINGLE PLY ROOFING SYSTEM (TPO).

1.3 REFERENCE STANDARDS

- A. FM Global (www.fmglobal.com).
- B. SPRI (Single Ply Roofing Industry) (www.spri.org):
 - 1. **ANSI/SPRI/FM 4435/ES-1** – Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

1.4 PREINSTALLATION MEETINGS

- A. Convene preinstallation meeting 1 week before start of installation of fascia system.
- B. Require attendance of parties directly affecting Work of this Section, including Contractor, Architect, installer, and manufacturer's representative.
- C. Review the Following:
 - 1. Materials.
 - 2. Examination of roof edge areas.
 - 3. Installation.
 - 4. Cleaning.
 - 5. Protection.
 - 6. Coordination with other Work, including roofing installation.

1.5 SUBMITTALS

- A. Comply with Section 013300 – SUBMITTAL PROCEDURES.

- B. Products shall be manufactured in specified manufacturer's facilities. Products fabricated by installer or other fabricator will not be acceptable unless fabricator can demonstrate to Architect's satisfaction that products have been tested for resistance in accordance with Test Method RE-1 and RE-2 of ANSI/SPRI ES-1.
- C. Product Data: Submit manufacturer's product data, including installation instructions.
- D. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating dimensions, materials, components, fasteners, finish, and accessories.
- E. Samples: Submit manufacturer's sample of fascia system.
 - 1. Sample Size: Minimum 6" long.
- F. Color Samples: Submit manufacturer's color samples of exterior fascia covers, consisting of complete set of metal color chips representing manufacturer's full range of available colors.
- G. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- H. Manufacturer's Project References: Submit manufacturer's list of 10 successfully completed fascia system projects of similar size and scope to this Project, including project name and location, name of architect, and type and quantity of fascia systems furnished.
- I. Warranty Documentation: Submit manufacturer's standard warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged in the manufacturing of fascia systems of similar type to that specified for a minimum of 15 years.
- B. Installer's Qualifications:
 - 1. Installer regularly engaged in installation of fascia systems of similar type to that specified for a minimum of 5 years.
 - 2. Use persons trained for installation of fascia systems.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer's instructions.
 - 2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
 - 3. Store materials in clean, dry area indoors.

4. Do not store materials directly on floor or ground.
5. Protect materials and finish during storage, handling, and installation to prevent damage.

1.8 WARRANTY

- A. Wind Warranty Period: Warranted in wind conditions up to 215 mph with a Lifetime wind warranty. Warranty specified for individual products below.
- B. Warranty Period, Product: 5-year workmanship warranty covering replacement or repair of products that are defective in material or workmanship.
- C. Warranty Period, Finish: Limited 30-year warranty for prefinished coil-coated steel and aluminum coated with Kynar 500 standard colors covering fade, chalk, and film integrity.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Metal-Era, LLC, 1600 Airport Road, Waukesha, Wisconsin 53188. Phone 800-558-2162. www.metalera.com. info@metalera.com.
- B. Substitutions: Comply with Section 012500 – SUBSTITUTION PROCEDURES.
- C. Single Source: Furnish materials from single manufacturer.

2.2 FASCIA SYSTEM

- A. Basis of Design Fascia System: “Anchor-Tite Drip Edge”.
 1. Description:
 - a. Fascia with extruded aluminum anchor bar.
 - b. For single-ply roofing.
 2. Face Size: Indicated on the Drawings.
 3. Roof Flange: Flat Roof Pitch ¼-inch:12.
 4. Approvals:
 - a. ANSI/SPRI/FM 4435/ES-1 up to 98 psf Horizontal.
 - b. FM Approved up to 1-90 Perimeter and 1-75 Corner.
 - c. Miami-Dade County Approved.
 - d. Florida Product Approval.
 5. Extruded Anchor Bar:
 - a. Material: Aluminum.
 - b. Thickness: Varies based on face height.
 - c. Extruded Lengths: 12’-0”.
 - d. Fastener Holes: Pre-Punched.

- 6. Anchor Bar Splices:
 - a. Material: Aluminum.
- 7. Lap Joints
 - a. Material: Same as exterior fascia covers.
 - b. Finish and Color: Same as exterior fascia covers.
 - c. Width: 1”.
 - d. Finish: Prefinished Kynar.
 - e. Color: To be selected.
- 8. Fasteners:
 - a. Suitable for intended substrate.
 - b. Provided by fascia system manufacturer.
- B. Accessory Type: Factory Fabricated Quicklock.
 - 1. Accessories:
 - a. Material, Finish, and Color: Same as exterior fascia covers.
 - b. Miters:
 - 1) Outside.
 - 2) Inside.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roof edge areas, including roofing and blocking, to receive fascia system.
- B. Verify surfaces to support fascia system are clean, dry, straight, secure, and of proper dimensions.
- C. Notify Architect, Owner’s representative, and roofing installer of conditions that would adversely affect installation.
- D. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. Install fascia system in accordance with manufacturer’s instructions at locations indicated on the Drawings. Roofing: Specified in Section 075423 – SINGLE PLY ROOFING SYSTEM (TPO).
- B. Fasteners:
 - 1. Install fascia system using concealed fasteners in accordance with manufacturer’s instructions.

- 2. Do not penetrate Horizontal roofing surface with fasteners.
- C. Sealant: Apply continuous beads of sealant in accordance with manufacturer's instructions.
- D. Thermal Expansion: Create gap between retainer sections and between fascia sections in accordance with manufacturer's instructions to allow for thermal expansion.
- E. Review lengths of straight pieces of exterior fascia covers before cutting to avoid creating relatively short sections adjacent to full-length sections.
- F. Isolate fascia system from ACQ treated wood blocking or other galvanically incompatible material with appropriate material.

3.3 CLEANING

- A. Clean fascia system promptly after installation in accordance with manufacturer's instructions.
- B. Remove clear protective vinyl film.
- C. Do not use harsh cleaning materials or methods that could damage finish.

3.4 PROTECTION

- A. Protect installed fascia system to ensure that, except for normal weathering, fascia system will be without damage or deterioration at time of Substantial Completion.

END OF SECTION 077119

SECTION 078400 - FIRESTOPPING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. System Performance Requirements: Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.
1. Contractor shall ensure that all Firestop Products are from a single manufacturer to ensure consistent application throughout the facility.
 2. Provide through-penetration firestop systems with F ratings if indicated, as determined per ASTM E 814, but not less than the fire-resistance rating of the constructions penetrated.
 3. Provide joint sealants with fire-resistance ratings indicated, as determined per ASTM E 119, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.
 4. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
 5. For firestopping exposed to view, provide products with flame-spread values of less than 25 and smoke-developed values of less than 450, as determined per ASTM E 84.

1.2 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
1. **ASTM C719** – Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).
 2. **ASTM C920** – Standard Specification for Elastomeric Joint Sealants.
 3. **ASTM C1193** – Standard Guide for Use of Joint Sealants.
 4. **ASTM E84** – Standard Test Method for Fire Tests of Penetration Firestop Systems.
 5. **ASTM E119** – Standard Test Methods for Fire Tests of Building Construction and Materials.
 6. **ASTM E136** – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750° C.
 7. **ASTM E814** – Standard Test Method for Fire Tests of Penetration Firestop Systems.
- B. Underwriters Laboratories (UL).
- C. Sealant Classifications (ASTM C920):
1. Sealant Type:
 - a. **M** – Two or more components, chemically cured.
 - b. **S** – Single component, air or moisture cured.

2. Sealant Grades:
 - a. **NS** – Non-sag sealants.
3. Sealant Classes:
 - a. **25** – Sealant capable of handling movement (contraction or expansion) of 25% of original joint width.
4. Sealant Uses:
 - a. **A** – In contact with aluminum.
 - b. **G** – In contact with glass.
 - c. **M** – In contact with mortar.
 - d. **NT** – Non-traffic (pedestrian or vehicular) contact.
 - e. **O** – In contact with other materials.

1.3 SUBMITTALS

- A. In addition to product data for each type of product specified, submit the following:
 1. Certification by firestopping manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs) and are nontoxic to building occupants.
 2. Shop drawings detailing materials, installation methods, and relationships to adjoining construction for each through-penetration firestop system, and each kind of construction condition penetrated and kind of penetrating item along with design designation of qualified testing and inspecting agency.
 3. Product certificates signed by manufacturers of firestopping products certifying compliance of their products with specified requirements.
 4. Product test reports from a qualified testing and inspecting agency evidencing compliance of firestopping with requirements based on comprehensive testing of current products.

1.4 QUALITY REQUIREMENTS

- A. Fire-Test-Response Characteristics: Provide firestopping that complies with the following requirements and those specified under the "System Performance Requirements" paragraph 1.1A:
 1. Firestopping tests are performed by a qualified testing and inspecting agency, including UL, Warnock Hersey, or another agency performing testing and follow-up inspection services, that is acceptable to Authorities Having Jurisdiction (AHJ).
 2. Through-penetration firestop systems are identical to those tested per ASTM E 814 under conditions where positive furnace pressure differential of at least 0.01 inch of water is maintained at a distance of 0.78 inch below the fill materials surrounding the penetrating items in the test assembly.

3. Fire-resistive joint sealant systems are identical to those tested for fire-response characteristics per ASTM E 119 under conditions where the positive furnace pressure differential is at least 0.01 inch of water, as measured 0.78 inch from the face exposed to furnace fire.
4. Ratings of Firestopping: As indicated by reference to designations of UL in their "Fire Resistance Directory" or by another qualified testing and inspecting agency.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Through-Penetration Firestop Systems: Comply with the following requirements in providing system components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating firestops under conditions of service and application, based on testing and field experience. All Firestop Components shall be from the same Manufacturer to ensure compliance and compatibility with surrounding components.
 1. Manufacturers: Provide complete firestop systems and components from one of the following:
 - a. Hilti Firestop Systems, Plano, TX.
 - b. 3M Fire Protection Products, St. Paul, MN.
 - c. Tremco® TREMstop® Fire Protection Products, Beachwood, OH.
 - d. USG Firestop Systems, United States Gypsum Company, Chicago, IL.
 - e. Or approved equivalent.
 2. Accessories: Provide the following components for each firestopping system as needed to install fill materials and to comply with "System Performance Requirements" paragraph 1.1A:
 - a. Permanent forming/damming/backing materials including the following:
 - 1) Semi-refractory fiber (mineral wool) insulation, noncombustible, moisture-resistant, Thermafiber® Safing™ Mineral Wool Insulation as manufactured by Thermafiber, Inc., Toledo, OH, or approved equivalent. Provide minimum 4.0 PCF, 6" thick safing insulation for perimeter slab edge firestopping and firestopping of penetrations in locations as shown on the Drawings. Provide minimum 8 PCF, nominal 3" thick mineral wool insulation for installation in spandrel panel assemblies.
 - 2) Ceramic fiber.
 - 3) Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
 - 4) Fire-rated formboard.
 - 5) Joint fillers for joint sealants.
 - b. Temporary forming materials.
 - c. Substrate primers.

- d. Collars.
 - e. Steel sleeves.
3. Fill Materials: Provide through-penetration firestop systems composed of the fill materials indicated below:
- a. Ceramic-Fiber and Mastic Coating: Ceramic fibers in bulk form formulated for use with mastic coating, and ceramic fiber manufacturer's mastic coating.
 - b. Ceramic-Fiber Sealant: Single-component formulation of ceramic fibers and inorganic binders.
 - c. Endothermic, Latex Compound Sealant: Single-component, endothermic, latex formulation.
 - d. Intumescent, Latex Sealant: Single-component, intumescent, latex formulation.
 - e. Intumescent Putty: Nonhardening, dielectric, water-resistant putty containing no solvents, inorganic fibers, or silicone compounds.
 - f. Intumescent Wrap Strips: Single-component, elastomeric sheet with aluminum foil on one side.
 - g. Job-Mixed Vinyl Compound: Prepackaged vinyl-based powder product for mixing with water at Project site to produce a paintable compound, passing ASTM E 136, with flame-spread and smoke-developed ratings of zero per ASTM E 84.
 - h. Mortar: Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogenous mortar.
 - i. Pillows/Bags: Re-usable, heat-expanding pillows/bags composed of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.
 - j. Silicone Foam: Two-component, silicone-based liquid elastomer that, when mixed, expands and cures in place to produce a flexible, nonshrinking foam.
 - k. Silicone Sealant: Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealant.
 - l. Solvent-Release-Curing Intumescent Sealant: Solvent-release-curing, single-component, synthetic-polymer-based sealant.

2.2 ELASTOMERIC JOINT SEALANTS

- A. Fire-Resistive Elastomeric Joint Sealants: Chemically curing, elastomeric sealants of base polymer indicated complying with ASTM C 920 requirements and requirements specified in this Section applicable to fire-resistive joint sealants.
 - 1. Sealant Colors. Furnish and install fire rated sealants in the following colors for partition conditions indicated:
 - a. **RED** at Fire Barrier Partitions.
 - b. **BLUE** at Smoke Barrier Partitions.
 - c. **GREEN** at Smoke Resistant Partitions.

2. No other colors permitted for fire rated sealants.
3. Coordinate with Life Safety Plans and Partition Types as shown on the Drawings.
4. Single-Component, Neutral-Curing Silicone Sealant: Type S; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, G, A, and (as applicable to joint substrates indicated) O.
 - a. Additional capability, when tested per ASTM C 719, to withstand the following percentage changes in joint width as measured at time of installation and still comply with other requirements of ASTM C 920:
 - 1) 50 percent movement in both extension and compression for a total of 100 percent movement.
 - 2) 100 percent movement in extension and 50 percent movement in compression for a total of 150 percent movement.
5. Multicomponent, Nonsag, Urethane Sealant: Type M; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, A, and (as applicable to joint substrates indicated) O.
 - a. Additional capability, when tested per ASTM C 719, to withstand the following percentage changes in joint width as measured at time of installation and still comply with other requirements of ASTM C 920:
 - 1) 40 percent movement in extension and 25 percent in compression for a total of 65 percent movement.
 - 2) 50 percent movement in both extension and compression for a total of 100 percent movement.
6. Single-Component, Nonsag, Urethane Sealant: Type S; Grade NS; Class 25; and Uses NT, M, A, and (as applicable to joint substrates indicated) O.

2.3 WALL IDENTIFICATION

- A. Furnish and install wall identification at all rated partitions and non-rated smoke partitions as shown on the Drawings.
- B. Wall identification may be by painted stencil or self-adhesive signs using the following colors for written text:
 1. **RED** at Fire Barrier Partitions.
 2. **BLUE** at Smoke Barrier Partitions.
 3. **GREEN** at Smoke Resistant Partitions.
- C. No other colors permitted for signs or painted stenciling.
- D. Refer to Drawings, for rated partition types and locations, and for specific text to use for painted stenciling or self-adhesive signs. See sample wall identification sign at the end of this Section. Wall identification sign format and text shall be approved by local Fire Marshal or other Authorities Having Jurisdiction (AHJ).

PART 3 - EXECUTION

3.1 INTALLATION

- A. Install through-penetration firestops to comply with the "System Performance Requirements" paragraph 1.1A and the through-penetration firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install fire-resistive joint sealant to comply with the "System Performance Requirements" paragraph 1.1A, with ASTM C 1193, and with the sealant manufacturer's installation instructions and drawings pertaining to products and applications indicated.

END OF SECTION 078400

WARNING!
FIRESTOPPED APPLICATION
DO NOT REMOVE!

To maintain UL Classification in retrofiting, reseal with product utilities in System below:

Product Installed: _____

UL System #: _____

Date of Installation: _____

Installing Contractor: _____

Contractor Telephone: _____

WARNING!
FIRESTOPPED APPLICATION
DO NOT REMOVE!

To maintain UL Classification in retrofiting, reseal with product utilities in System below:

Product Installed: _____

UL System #: _____

Date of Installation: _____

Installing Contractor: _____

Contractor Telephone: _____

SECTION 079200 - JOINT SEALANTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preparing substrate surfaces.
- B. Interior and Exterior Sealants and joint backing.

1.2 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. **ASTM C794** – Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.
 - 2. **ASTM C834** – Standard Specification for Latex Sealants.
 - 3. **ASTM C919** – Standard Practice for Use of Sealants in Acoustical Applications.
 - 4. **ASTM C920** – Standard Specification for Elastomeric Joint Sealants.
 - 5. **ASTM C1193** – Standard Guide for Use of Joint Sealants.
 - 6. **ASTM C1248** – Standard Test Method for Staining of Porous Substrate by Joint Sealants.
 - 7. **ASTM C1521** – Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
 - 8. **ASTM E84** – Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 9. **ASTM E90** – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - 10. **ASTM E814** – Standard Test Method for Fire Tests of Penetration Firestop Systems.
- B. Sealant, Waterproofing, and Restoration Institute (SWRI):
 - 1. **SWRI Validation** – SWR Institute Validated Products Listing:
www.swrionline.org/ValidatedSealants.
- C. Sealant Classifications (ASTM C920):
 - 1. Sealant Type:
 - a. M – Two or more components, chemically cured.
 - b. S – Single component, air or moisture cured.
 - 2. Sealant Grades:
 - a. NS – Non-sag sealants.
 - b. P – Pourable sealants, self-leveling.
 - 3. Sealant Classes:

- a. 25 – Sealant capable of handling movement (contraction or expansion) of 25% of original joint width.
- b. 35 – Sealant capable of handling movement (contraction or expansion) of 35% of original joint width.
- c. 50 – Sealant capable of handling movement, either contraction or Expansion, of 50% of the original joint width.
- d. 50/100 – Sealant capable of handling movement of 50% contraction and 100% expansion.

4. Sealant Uses:

- a. A – In contact with aluminum.
- b. G – In contact with glass.
- c. M – In contact with mortar.
- d. NT – Non-traffic (pedestrian or vehicular) contact.
- e. O – In contact with other materials.
- f. T – Traffic (pedestrian or vehicular) contact.

D. Underwriters Laboratories (UL):

- 1. **UL 1479** – Fire Tests of Penetration Firestops.

1.3 SUBMITTALS

- A. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, limitations, color availability. Provide manufacturer's test reports for joint sealants evidencing compliance with ASTM requirements.
- B. Samples
 - 1. Submit manufacturer's standard color charts for initial selection of sealant color(s).
 - 2. Following initial color selection, submit two (2) samples of manufacturer's standard size sealant samples illustrating actual sealant color(s) for final selection.
- C. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation, conditions requiring special attention.

1.4 QUALITY ASSURANCE

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

1.5 PRECONSTRUCTION TESTING

- A. Arrange for field testing of typical combinations of sealants, substrates, and joint backing to confirm adhesion and non-staining of substrates.
- B. Adhesion Testing shall be as per ASTM C1521 to determine whether primer is required for cured sealants to achieve optimum bond to substrates.

- C. Stain Testing shall be as per ASTM C1248 to determine the potential of staining where silicone sealants contact stone or masonry substrates.
- D. Testing is not required if sealant manufacturers provide test data showing previous sealant testing, not older than twenty-four (24) months from start of project, indicates satisfactory adhesion as per ASTM C794 and absence of staining as per ASTM C1248 for comparable sealant assemblies.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Applicator: Company specializing in performing the work and qualified by the sealant manufacturer.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.8 COORDINATION

- A. Coordinate the work with all sections referencing this section.

1.9 WARRANTY

- A. Provide manufacturer's twenty (20) year warranty for structural adhesion, weathersealing, and non-staining performance of all silicone sealants.
- B. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, water tight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 - PRODUCTS

2.1 EXTERIOR SEALANTS

- A. Exterior Building Silicone Sealant: Single component silicone, non-sagging, non-staining, non-bleeding, color as selected by Architect, meeting requirements of ASTM C920 for Type S, Grade NS, Class 50 or 50/100, Use NT, M, G, A, O, and having current SWRI validation:
 - 1. Dow Corning® No. 795 Silicone Building Sealant (Dow Corning Corporation, www.dowcorning.com).
 - 2. Pecora 890NST or 890FTS (Field Tintable) Non-Staining, Ultra-Low Modulus Silicone Sealant (Pecora Corporation®, Harleysville, PA, www.pecora.com).
 - 3. Momentive™ SCS2700 SilPruf LM Silicone Weatherproofing Sealant (Momentive Performance Materials, www.ge.com/silicones).
 - 4. Or approved equivalent.

- B. Exterior Building Silicone Sealant – Secondary Joint Waterproofing: Single component, medium-modulus silicone sealant meeting requirements of ASTM C920 for Type S, Grade NS, Class 50, Use NT, G, M, A, and O, and having current SWRI validation, color as selected by Architect, for secondary joint waterproofing at exterior window openings as shown on the Drawings:
1. Dow Corning® No. 756 SMS Building Sealant (Dow Corning Corporation, www.dowcorning.com).
 2. Or approved equivalent.
- C. Exterior Polyurethane Sealant: Single or double component, self-leveling polyurethane sealant complying with ASTM C920, color as selected by Architect, for horizontal expansion joints in paving, concrete, and sidewalks:
1. Tremco® Vulkem® 45SSL (single-component, Type S, Grade P, Class 35, Use T, M, A, O) or Tremco® THC 900 (two-component, Type M, Grade P, Class 25, Use T, M, O) (Tremco Commercial Sealants & Waterproofing, Beachwood, OH, www.tremcosealants.com).
 2. Pecora Urexapan NR-201 (single-component, Type S, Grade P, Class 25, Use M, A, O; SWRI Validation) or Pecora DynaTrol® II-SG (two-component, Type M, Grade P, Class 25, Use T) (Pecora Corporation®, Harleysville, PA, www.pecora.com).
 3. Or approved equivalent.

2.2 INTERIOR SEALANTS

- A. Interior Building Polyurethane Sealant: Single-component, non-sagging, polyurethane, paintable, white or off-white color, meeting requirements of ASTM C920 for Type S, Grade NS, Class 25, Use NT, T, M, A, G, O and having current SWRI validation. For interior joints of aluminum storefront, and doors at exterior wall openings:
1. Pecora Dynatrol™ I-XL General Purpose Polyurethane Sealant (Pecora Corporation®, Harleysville, PA, www.pecora.com).
 2. Or approved equivalent.
- B. Interior Building Acrylic Latex Caulk: All purpose, Architectural grade acrylic latex caulk plus silicone, mold and mildew resistant, paintable, color as selected by Architect, meeting requirements of ASTM C834:
1. DAP® ALEX PLUS® All Purpose Acrylic Latex Adhesive Caulk Plus Silicone as manufactured by DAP, Inc., Baltimore, MD, www.dap.com.
 2. Pecora AC-20®+ Silicone Non-Sag, Acrylic Latex Caulking Compound as manufactured by Pecora Corporation®, Harleysville, PA, www.pecora.com.
 3. Or approved equivalent.
- C. Interior Building Acoustical Sealant: Single component, flexible latex sealant, white or off-white color, meeting ASTM C834 and capable of reducing airborne sound transmission through perimeter joints and openings in building construction as determined per ASTM E90 based on installation per ASTM C919. Coordinate with Section 092900 – GYPSUM BOARD and partition types as shown on the Drawings:

1. USG Sheetrock® Brand Acoustical Sealant as manufactured by United States Gypsum Company, Chicago, IL, www.usg.com.
2. Pecora AC-20® FTR (Fire & Temperature Rated) Acoustical & Insulation Sealant or Pecora AIS-919 Acoustical & Insulation Latex Sealant as manufactured by Pecora Corporation®, Harleysville, PA www.pecora.com.
3. Or approved equivalent.

2.3 ACCESSORIES

- A. Primer: Non-staining type, if recommended by sealant manufacturer to suit application, based on preconstruction testing described in paragraph 1.5.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round, closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width; acceptable to manufacturer of sealant.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- E. Insulating Foam Sealant: Expanding polyurethane foam sealant for sealing and insulating miscellaneous exterior wall and roof penetrations, wall cavities, and gaps at head of wall and roof deck conditions in locations as shown and detailed on the Drawings.
 1. Basis of Design: Abesco FP200 FR Expanding Foam, single pack, fire rated polyurethane expanding foam as manufactured by Abesco LLC, Orlando, FL, (407) 851-3300, www.FP200abesco.com having the following characteristics:
 - a. Fire rated for use in 1 and 2 hour rated systems meeting ASTM E-814/UL 1479.
 - b. Flame Spread 10 and Smoke Developed 35 for Class A rating as per ASTM E-84.
 - c. 60% closed cell content when fully cured.
 2. Or approved equivalent.
- F. Miscellaneous Materials: All other materials, not specifically described in this section but required for complete and proper installation of sealant systems, shall be new, first quality of their respective kinds, and as recommended by the sealant manufacturer subject to review and approval of the Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

- A. Remove loose materials and foreign matter which might impair adhesion of sealant.
- B. Clean joints in accordance with manufacturer's instructions. Prime if recommended by manufacturer for application condition.
- C. Perform preparation in accordance with manufacturer's instructions.
- D. Protect elements surrounding the work of this section from damage or disfiguration.

3.3 INSTALLATION

- A. Install sealant in accordance with manufacturer's instructions and ASTM C1193.
- B. Measure joint dimensions and size materials to achieve required width/depth ratios.
- C. Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.
- D. Install bond breaker where joint backing is not used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Tool joints concave.

3.4 CLEANING

- A. Clean work as per manufacturer's instructions.
- B. Clean adjacent soiled surfaces as work progresses.

3.5 PROTECTION OF FINISHED WORK

- A. Protect finished installation until sealants are cured.

3.6 SCHEDULE

	Location	Type	Color
A.	Vertical and Non-Traffic Horizontal Exterior Joints Metal-to-Metal Metal-to-Masonry Metal-to-Glass Masonry-to-Masonry	Silicone Non-staining	To Be Selected
B.	Exterior Expansion Joints Vertical, General	Silicone Non-sagging	To Be Selected

C.	Exterior Joints (Concrete) Horizontal, General	Polyurethane Self-Leveling	To Be Selected
D.	Exterior Paving Joints (Asphalt)	Polyurethane Self-Leveling	Black
E.	Interior Joints at Junction with Exterior Wall: Door & Window Frames.	Polyurethane	White or Off-White
F.	Interior Joints at Door & Window Frames (Low to No Expected Movement)	Acrylic Latex Non-sagging	White or Off-White
G.	Joints at Miscellaneous Penetrations of Exterior Wall Assemblies, and Internal Wall Cavities of Exterior Walls.	Polyurethane Insulating Foam	Orange, White, Off White

END OF SECTION 079200

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SECTION 081250 - INTERIOR ALUMINUM DOOR FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Related Documents:

1. Provisions established within the General and Supplementary Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

B. Section Includes:

1. Aluminum door frames for interior use.
2. Locations as shown and scheduled on the Drawings.

C. Related Sections:

1. Section 081416 – ARCHITECTURAL WOOD DOORS.
2. Section 087100 – DOOR HARDWARE.
3. Section 088000 – GLAZING.
4. Section 130900 – RADIATION PROTECTION.

D. Reference Standards:

1. Aluminum Association (AA).
2. American Architectural Manufacturers Association (AAMA).
3. American Society for Testing and Materials (ASTM):
 - a. **ASTM B29** – Standard Specification for Refined Lead.
 - b. **ASTM B221** – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - c. **ASTM B749** – Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
 - d. **ASTM E152** – Standard Methods of Fire Tests of Door Assemblies (Inactive).
4. Federal Specifications (FS):
 - a. **FS QQ-L-201F** – Lead Sheet.
5. National Fire Protection Association (NFPA):
 - a. **NFPA 252** – Standard Methods of Fire Tests of Door Assemblies.
6. Uniform Building Code (UBC).

1.2 SUBMITTALS

- A. Submit under provisions of Section 013300 – SUBMITTAL PROCEDURES.

- B. Product Data: Submit for aluminum, door frames.
 - 1. Include information for factory finish, glazing gaskets, accessories and other required components.
 - 2. Include color charts for finish indicating manufacturer's standard colors available for selection.
- C. Shop Drawings: Submit schedule indicating opening identification number, frame types, dimensions, swing, label, and hardware requirements. Use same reference numbers for openings as Contract Drawings.
- D. Include elevations and details indicating frame types, profiles, conditions at openings, methods and locations of anchoring, hardware locations, and reinforcements for hardware, details of connections to special construction and other custom features.
- E. Samples: Submit following:
 - 1. Samples indicating quality of finish in selected colors on alloys used for Work.
 - 2. Where normal color and texture variations are expected, include additional samples to show range of such variation.
- F. Informational Submittals: Submit manufacturer's instructions.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide aluminum door frames and accessories produced by a single manufacturer for each type of product indicated.
- B. Manufacturer's Qualifications: Manufacturer shall demonstrate previous experience in manufacturing of interior aluminum door and framing for a period of not less than 10 years on comparable sized project.
- C. Fire and Smoke Rated Assemblies:
 - 1. Where fire-rated openings are scheduled or required by Authorities Having Jurisdiction (AHJ), provide fire-rated aluminum frames that have been tested and certified to meet the requirements of UBC 7.2 Positive Pressure Test for specified exposure by an agency acceptable to governing authorities.
 - 2. Provide labels permanently fastened on each fire-rated frame and door that are within size limits established by NFPA and the testing authority.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver frames in cartons to provide protection during transit and storage at project site.
- B. Inspect frames upon delivery for damage.
 - 1. Repair minor damage to pre-finished products by means as recommended by manufacturer.
 - 2. Replace frames that cannot be satisfactorily repaired.

- C. Store frames at project site under cover and as near as possible to final installation location. Do not use covering material that will cause discoloration of aluminum finish.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not begin installation of frames until area of work has been completely enclosed and interior is protected from the elements.
- B. Maintain temperature and humidity in areas of installation within reasonable limits, as close as possible to final occupancy. If necessary, provide temperature control and ventilation to maintain required environmental conditions.

1.7 WARRANTY

- A. Warrant against defects in manufacturing of materials for a period of one (1) year from date of Substantial Completion.
- B. Warrant framing finish against defects, including cracking, flaking, blistering, peeling, and excessive fading, chalking and non-uniformity in color for a period of five (5) years.

PART 2 - PRODUCTS

2.1 BASIS OF DESIGN MANUFACTURER AND PRODUCTS

- A. Basis of Design Manufacturer:
 - 1. Meet or exceed standards of manufacture, appearance, performance, function, and design, of RACO Interior Products, Inc., 7354 Denny Road, Suite 100, Houston TX, 77040, (800) 272-7226, Fax: (713) 682-2079, www.racointeriors.com, or approved equivalent.
 - 2. Substitutions: Comply with provisions of Section 016000 – PRODUCT REQUIREMENTS and Section 012500 – SUBSTITUTION PROCEDURES.
- B. Basis of Design Products:
 - 1. Interior Door Frames – Basis of Design: RACO Classic fixed throat frames to accommodate wall thicknesses as shown on the Drawings.
 - 2. Interior Fire-Rated and Lead-Lined Frames – Basis of Design: RACO Solutions II fixed throat and adjustable throat frames to accommodate wall thicknesses as shown on the Drawings with applied full face trim of 1-1/2-inch width.
 - a. Provide fire-rated frames of minute rating as shown on the Drawings and complying with UBC 7-2, ASTM E152, and NFPA 252.
 - b. Provide non-rated lead-lined frames in locations as scheduled on the Drawings. Factory installed lead on frames shall be 1/16-inch (0.0625-inch) thick and complying with ASTM B29, ASTM B749, and FS QQ-4-201F, Type C. Provide fixed throat frames for 60 minute rating and adjustable throat frames for 90 minute rating.

2.2 MATERIALS

- A. Aluminum: Meeting requirements of ASTM B221, 6063T5 alloy, and as otherwise required to assure compliance with dimensional tolerances and maintain color uniformity. Billets shall be composed of at least 33% recycled aluminum.
- B. Lead Shielding: Meeting requirements of ASTM B29 and ASTM B749 for refined lead, 99.9% pure lead, Type C, per Federal Specification FS QQ-L-201F.
- C. Anchorage Devices, Clips and Fasteners: Manufacturer's standard type, compatible with materials being secured.
- D. Accessories: As necessary for complete system.

2.3 EXTRUDED ALUMINUM DOOR FRAME FABRICATION

- A. Factory pre-machine door frame jambs and prepare for hardware, with concealed reinforcement plates, drilled and tapped as required, and fastened within frame with concealed screws.

2.4 FINISHES

- A. Provide factory finish extruded door frame components so that all parts exposed to view upon completion of installation are uniform in finish and color. Exposed surfaces shall be free of scratches and other serious blemishes.
- B. Class II Clear Anodized: AAMA 611, AA-M12C22A31, Class II, minimum thickness 0.4 mill acid etched, medium matte, clear anodic coating.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine project conditions and verify that project is ready for work of this section to proceed. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Verify wall thickness does not exceed manufacturer's recommended tolerances of specified throat size.

3.2 INSTALLATION

- A. Comply with frame manufacturer's printed installation instructions and approved shop drawings. Do not attempt installation in areas where wall thickness exceeds tolerances of specified throat size.
- B. Install frames plumb and square, free from warp or twist, securely anchored to substrates with fasteners recommended by frame manufacturer. Maintain dimensional tolerances and alignment with adjacent work. Ensure joints are hairline tight and surfaces flush with adjacent components.

- C. Set all door frames in correct locations as shown on the Drawings, level, square, plumb and in alignment with other work in accordance with the manufacturer's installation instructions and approved shop drawings.
- D. Install sidelite glass in accordance with Section 088000 – GLAZING.

3.3 ADJUSTING AND CLEANING

- A. Protect exposed portions of aluminum surfaces from damage by gypsum board “mud” compounds, lime, acid, cement, and other contaminants.
- B. Touch up marred areas so that touch-up is not visible from a distance of 4 feet. Remove and replace frames that cannot be satisfactorily adjusted.

3.4 PROTECTION

- A. Protect as required to assure that frames and doors will be without damage until Substantial Completion.

END OF SECTION 081250

SECTION 081416 - ARCHITECTURAL WOOD DOORS

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. Solid core veneer-faced, flush wood interior doors, rated and non-rated and radiation shielded (lead lined).
2. Sizing by manufacturer.
3. Machining by manufacturer.
4. Finishing by manufacturer.

B. Related Requirements:

1. Section 081250 – INTERIOR ALUMINUM DOOR FRAMES.
2. Section 087100 – DOOR HARDWARE.
3. Section 088000 – GLAZING.
4. Section 088117 – FIRE-RATED GLAZING.
5. Section 130900 – RADIATION PROTECTION.

C. SCOPE

1. Furnish and install doors in locations as shown and scheduled on the Drawings.
2. Furnish doors with removable protective covering to protect veneer faces.
3. Furnish doors in veneer and stained finish as selected by the Architect.

D. REFERENCE STANDARDS

1. Architectural Woodwork Standards (AWS):
 - a. **AWS Section 5 – Finishing, System 9:** UV Curable, Acrylated Epoxy, Polyester or Urethane.
2. Builders Hardware Manufacturers Association (BHMA):
 - a. **156.115-W** – Hardware Preparation in Steel Doors or Steel Frames
3. Door and Hardware Institute (DHI):
 - a. **WDHS-3** – Recommended Hardware Locations for Wood Flush Doors
4. National Fire Protection Association (NFPA):
 - a. **NFPA 80** – Standard for Fire Doors and Other Opening Protectives.

- b. **NFPA 105** – Standard for Smoke Door Assemblies and Other Opening Protectives.
 - c. **NFPA 252** – Standard Methods of Fire Tests of Door Assemblies.
5. Wood Door Manufacturer’s Association (WDMA):
- a. **I.S.-1A** – Industry Standard for Architectural Flush Wood Doors.
 - b. **TM-6** – Adhesive Durability: Test Method for Determining the Durability of Adhesives Used in Doors Under Accelerated Aging Conditions.
 - c. **TM-7** – Cycle Slam Test: The Method for Determining the Physical Endurance of Wood Doors & Associated Hardware Connections under Accelerated Operating Conditions.
 - d. **TM-8** – Hinge Loading Test: The Method for Determining the Hinge Loading Resistance of Wood Door Stiles.
 - e. **TM-10** – Screw Holding Capacity: Test Method for Determining the Screw Holding Capacity of Wood Doors.
 - f. **TR-8** – Factory Finish Guide: UV Cured Acrylated Polyesters/Urethanes.
6. Underwriters Laboratories (UL):
- a. **UL10C** – Standard for Positive Pressure Fire Tests of Door Assemblies.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
- B. Discussion Topics:
 - 1. Delivery, storage, and handling.
 - 2. Coordination with hardware installers and access control installers (if specified for door operation).
 - 3. Protection of installed doors.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of door. Include details of core and edge construction and trim for openings.
 - 1. Radiation Shielded (Lead-Lined) Doors.
 - 2. Non-Rated Doors.
 - 3. Fire Rated Doors.
 - 4. Glazed Openings.
 - 5. Finishes.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
 - 1. Dimensions and locations of blocking.
 - 2. Dimensions and locations of mortises and holes for hardware.
 - 3. Dimensions and locations of cutouts and glazed openings.

4. Undercuts.
5. Requirements for veneer matching.
6. Doors to be factory finished (stained).
7. Use same unit designations used in Contract Documents.
8. Dimensions, thickness, and location of lead radiation shielding.

C. Samples for Initial Selection: For wood - veneer doors.

1. Available standard stain colors and gloss options, Submit samples in the form of actual materials; printed brochures are not acceptable.
2. Available molding profiles for glazed openings.

D. Samples for Verification:

1. Actual door face materials, approximately 8 by 10 inches (200 by 250 mm), for each material and finish. For each wood species, provide set of three samples showing typical examples of color and grain to be expected in finished work.
2. Provide construction samples of doors, approximately 5 by 5 inches (125 by 125 mm), with door faces and vertical edges representing actual construction to be used.
 - a. Provide unfinished samples for each species of wood veneer.
3. Light Opening Molding: Minimum 6-inches long, for each material, type and finish required.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For manufacturer's standard warranty.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. A qualified manufacturer that is a member in good standing of the Window and Door Manufacturers Association (WDMA).

B. Product Performance: Provide documents showing compliance to the following WDMA attributes, validating the specified WDMA Performance Duty Level:

1. Adhesive Bonding Durability: WDMA TM-6
2. Cycle Slam: WDMA TM-7
3. Hinge Loading: WDMA TM-8
4. Screw Holding: WDMA TM-10
 - a. Door Face
 - b. Vertical Door Edge
 - c. Horizontal Door Edge (applies when hardware is attached)

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package factory-finished doors individually in manufacturer's standard plastic bags, stretch wrap, or cardboard cartons.
- C. Mark each door on top rail with opening number used on Shop Drawings. Include manufacturer's order number and date of manufacture.
- D. Store doors inside building in clean and dry location.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during remainder of construction period.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
 - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.
 - 2. Warranty shall also include installation that may be required due to repair or replacement of defective doors.
 - 3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Product: Subject to compliance with requirements, furnish and install Aspiro® Series by Forte Opening Solutions, an IBP Solutions U.S. LLC Company, www.forteopenings.com (formerly Marshfield-Algoma™ Door Systems, Aspiro™ Series by Masonite Architectural) flush wood doors or equivalent products by one of the following:
 - 1. Graham® Wood Doors – Assa Abloy
 - 2. Eggers Industries.
 - 3. Or Approved Manufacturer.
- B. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 INTERIOR FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A-11, "Industry Standard for Interior Architectural Wood Flush Doors."
- B. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain added urea formaldehyde.
- C. WDMA I.S.1-A Performance Grade:
 - 1. Heavy Duty unless otherwise indicated.
 - 2. Extra Heavy Duty: Public toilets, assembly spaces, exits and where indicated.
 - a. All doors must meet specified WDMA Performance Duty Level, including face screw holding requirement. Surface applied hardware shall be installed with screws; through bolts are not acceptable.
- D. Fire-Rated Wood Doors: Conforming to NFPA 80: listed and labeled for required ratings based on testing at positive pressure NFPA 252 or UL10C by UL or other testing agencies acceptable to Authorities Having Jurisdiction (AHJ).

2.3 INTERIOR SOLID CORE FLUSH WOOD DOORS FOR TRANSPARENT SATIN FINISH – SELECT WOOD VENEER

- A. Basis of Design: Aspiro™ Series/by Forte Opening Solutions.
- B. Solid Core Select Wood Veneer, Non-Rated Flush Doors, Bonded Construction.
 - 1. Model No: A-PC-B-NR.
 - 2. Quality Standards: WDMA I.S 1.A Architectural Wood Flush Doors (Standard Construction).
 - 3. WDMA Quality Grade: Premium.
 - 4. WDMA Performance Level: Heavy Duty.
 - 5. Faces:
 - a. Veneer Grade: A.
 - b. Veneer Species: Basis of Design – White Maple.
 - c. Veneer Cut: Basis of Design – Plain Sliced.
 - d. Veneer Leaf Match: Basis of Design – Book Match.
 - e. Veneer Face Match/Assembly: Basis of Design – Running Match.
 - 6. Vertical Edges: Matching/compatible hardwood veneer edge band over Structural Composite Lumber (SCL) (1-1/4-inch before trim).
 - 7. Horizontal Edges: Structural Composite Lumber (SCL) (1-1/4-inch before trim).
 - 8. Core: Wood based particleboard (PC).
 - 9. Construction: Five plies; stiles and rails bonded to core, and entire unit abrasive planed before veneering. One piece High Density Fiberboard (HDF) crossbands, Type 1 face & core assembly adhesive.
 - 10. Thickness: 1-3/4-inch.
 - 11. Door Weight: 5.5 lbs./sq. ft.

12. Factory Finish: Standard manufacturer stain color.
13. Warranty: Full; life of original installation.

C. Solid Core Select Wood Veneer, Fire-Rated Flush Doors with Glazed Lites:

1. Model No: A-MC-B-FR90 (90 minute/1-1/2-hour rated).
2. Quality Standards – WDMA I.S.1A Architectural Wood Flush Doors (Standard Construction).
3. Pressure Rating: Verify if Category A Positive Pressure (Factory Installed Intumescent Seals), Category B Positive Pressure (Surface Applied Intumescent Seals), or Neutral Pressure is required. Coordinate with Section 087100 – DOOR HARDWARE.
4. WDMA Quality Grade: Premium.
5. WDMA Performance Level: Extra Heavy Duty – Mineral core with blocking.
6. Faces:
 - a. Veneer Grade: A.
 - b. Veneer Species: Basis of Design – White Maple.
 - c. Veneer Cut: Basis of Design – Plain Sliced.
 - d. Veneer Leaf Match: Basis of Design – Book Match.
7. Vertical Edges: Matching/compatible veneer edge band over hardwood composite fire stile.
8. Horizontal Edges: Manufacturer’s standard construction per label service listing.
9. Core - 90-Minute Doors: Mineral core with blocking options.
10. Crossbands: One piece High Density Fiberboard (HDF).
11. Face & Core Assembly Adhesive: Type 1.
12. Thickness: 1-3/4-inch.
13. Door Weight: 3.7 lbs./sq. ft.
14. Factory Finish: Meets WDMA TR-8 and AWS System 9. Standard. manufacturer stain color.
15. Warranty: Full; life of original installation.
16. Factory Glazing: Refer to Section 088117 – FIRE-RATED GLAZING for rated glazing required in view panels of fire-rated flush wood doors. Factory install fire-rated glazing in rated doors as scheduled on the Drawings.
17. Lite Openings: Provide wood wrapped metal vision frames for factory-installed fire-rated glazing.

D. Solid Core Select Wood Veneer, Non-Rated Flush Doors, Radiation Shielded.

1. Model No: A-PC-B-XR-NR.
2. Quality Standards: WDMA I.S.1A Architectural Wood Flush Doors (Standard Construction).
3. WDMA Quality Grade: Premium.
4. WDMA Performance Level: Not Applicable.
5. Faces:
 - a. Veneer Grade: A.
 - b. Veneer Species: Basis of Design – White Maple.

- c. Veneer Cut: Basis of Design – Plain Sliced.
 - d. Veneer Leaf Match: Basis of Design – Book Match.
 - e. Veneer Face Match/Assembly: Basis of Design – Running Match.
- 6. Vertical Edges: Matching/compatible hardwood veneer edge band over Structural Composite Lumber (SCL) (1-1/2-inches before trim).
 - 7. Horizontal Edges: Structural Composite Lumber (SCL) (1-1/2-inches before trim).
 - 8. Core: Wood-based particleboard cored with lead.
 - 9. Lead Location: One sheet, narrow side. (Note: Review hardware applications when ordering.)
 - 10. Lead Thickness: 1/32-inch (0.031-inch).
 - 11. Crossbands: One piece High Density Fiberboard (HDF).
 - 12. Face & Core Assembly Adhesive: Type 1.
 - 13. Door Thickness: 1-3/4-inch.
 - 14. Door Weight w/1/32-inch Lead: 7.7 lbs./sq.ft.
 - 15. Factory Finish: Meets WDMA TR-8 and AWS Section 5, System 9. Standard manufacturer stain colors.
 - 16. Warranty: Full; life of original installation.
 - 17. Door Locations:
 - a. Door No. 425 at CT Suite 425.
 - b. Door No. 425A at Dressing 425A.

2.4 FABRICATION

- A. Factory fit doors to frame opening sizes indicated. Comply with clearances specified in WDMA I.S-1A.
 - 1. Undercut: Maximum 3/8-inch above thresholds.
 - 2. Fire Rated Doors: Comply with NFPA 80.
- B. Openings: Cut and trim openings and install glazing at factory.
- C. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
 - 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

2.5 FINISHES

- A. Transparent: WDMA TR-8, UV Cured Acrylated Polyester/Urethane.
 - 1. Staining: Manufacturer's standard stain colors selected by Architect.
 - 2. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs. Any deficiencies must be corrected prior to door installation.
 - 2. Reject doors with defects.
- B. Inspect each door before installation for damage and defects per WDMA Section F-6. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 087100 - DOOR HARDWARE.
- B. Reference Standards:
 - 1. Wood Doors: WDMA I.S.-1A.
 - 2. Fire-Rated Doors: NFPA 80.
 - 3. Smoke and Draft Control Doors: NFPA 105.
- C. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- D. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for firerated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
 - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

3.3 ADJUSTING

- A. Operation: Correct any deficiency that prohibits the door from swinging or operating freely. Do not remove hinge screws after initial insertion. Shims used for alignment purposes must be inserted between hinge and frame. Do not insert shims between hinge and door.
- B. To prevent stile failure, insure that door closers are properly adjusted and do not limit the door opening swing. Limit door opening swing only with a properly located stop.

3.4 REPAIR

- A. Repair of damage or defects is subject to Architect's acceptance, including removal of soiling. Provide new replacement doors for doors that cannot be satisfactorily repaired.

3.5 PROTECTING AND CLEANING

- A. Protect installed doors from damage and soiling.
- B. Clean doors shortly before inspection for Substantial Completion.

END OF SECTION 081416

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

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: Kawneer Architectural Aluminum Storefront Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront units.
 - 1. Type of Kawneer Aluminum Storefront System includes:
 - a. TriFab™ VG 451T Framing system – 2-1/4” X 4-1/2” nominal dimension; Thermal; Front Glazed, Screw Spline, Fabrication. Provide at interior windows of new entry Vestibule 101 in locations as shown on the Drawings.
- B. Related Sections:
 - 1. 079200 - JOINT SEALANTS.
 - 2. 084229.23 – SLIDING AUTOMATIC ENTRANCES.

1.3 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM) Standards:
 - 1. **B221** Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 2. **B456** Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
 - 3. **B633** Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
 - 4. **E283** Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - 5. **E330** Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - 6. **E331** Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- B. American Architectural Manufacturers Association (AAMA):
 - 1. **AAMA TIR-A8** Structural Performance of Composite Thermal Barrier Framing Systems.
 - 2. **AAMA 505** Dry Shrinkage and Composite Performance Thermal Cycling Test Procedure.

3. **AAMA 501** Methods of Test for Exterior Walls.
4. **AAMA 1503** Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections.
5. **AAMA 501.4** Recommended Static Test Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Induced Interstory Drifts.
6. **AAMA 501.5** Test Method for Thermal Cycling of Exterior Walls.
7. **AAMA 611** Voluntary Specification for Anodized Architectural Aluminum.

C. The Society of Protective Coatings (SSPC):

1. **SSPC-Paint 12** Cold-Applied Asphalt Mastic (Extra Thick Film) [Inactive].

D. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

E. The Aluminum Association (AA).

1.4 PERFORMANCE REQUIREMENTS

A. Storefront System Performance Requirements:

1. Wind loads: Provide storefront system; include anchorage, capable of withstanding wind load design pressures as indicated on Sheet S001, and in conformance with 2021 Arkansas Fire Prevention Code (2021 IBC).
2. Air Leakage: The test specimen shall be tested in accordance with ASTM E 283. Air Leakage rate shall not exceed 0.06 cfm/ft² (0.3 l/s • m²) at a static air pressure differential of 6.2 psf (300 Pa) with interior seal, or, rate shall not exceed 0.06 cfm/ft² (0.3 l/s • m²) at a static air pressure differential of 1.6 psf (75 Pa) without interior seal.
3. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 8 psf (383 Pa) as defined in AAMA 501.
4. Uniform Load: A static air design load of 35 psf (1680 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
5. Seismic: When tested to AAMA 501.4, system must meet design displacement of 0.010 x the story height and ultimate displacement of 1.5 x the design displacement.
6. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures:
 - a. Temperature Change (Range): 0 deg F (-18 deg C); 180 deg F (82 deg C).
 - b. Test Interior Ambient-Air Temperature: [75 deg F (24 deg C)] .

- c. 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 for a minimum 3 cycles.
7. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than:
- a. Glass to Exterior – 0.47 (low-e).
 - b. Glass to Center – 0.44 (low-e).
 - c. Glass to Interior – 0.41 (low-e).
8. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:
- a. Glass to Exterior – 70frame and 69glass (low-e).
 - b. Glass to Center – 62frame and 68glass (low-e).
 - c. Glass to Interior – 56frame and 67glass (low-e).

1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum-framed storefront system indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum-framed storefront system and components required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum-framed storefront.
- F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12" (304.8 mm) lengths of full-size components and showing details of the following:
 - 1. Joinery.
 - 2. Anchorage.
 - 3. Expansion provisions.
 - 4. Glazing.
 - 5. Flashing and drainage.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.

- B. **Manufacturer Qualifications:** A manufacturer capable of providing aluminum-framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- C. **Source Limitations:** Obtain aluminum-framed storefront system through one source from a single manufacturer.
- D. **Product Options:** Drawings indicate size, profiles, and dimensional requirements of aluminum-framed storefront system and are based on the specific system indicated. Refer to Section 016000 - PRODUCT REQUIREMENTS. Do not modify size and dimensional requirements.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. **Pre-installation Conference:** Conduct conference at Project site to comply with requirements in Division 01 Section 013100 - PROJECT MANAGEMENT AND COORDINATION.

1.7 PROJECT CONDITIONS

- A. **Field Measurements:** Verify actual dimensions of aluminum-framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

1.8 WARRANTY

- A. **Manufacturer's Warranty:** Submit, for Owner's acceptance, manufacturer's standard warranty.
 - 1. **Warranty Period:** Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

PART 2 - PRODUCTS

2.1 Manufacturers

- A. **Exterior Storefront System - Basis-of-Design Product:**
 - 1. Kawneer Company Inc.
 - 2. Trifab™ Versa Glaze[™] (VG)451T (Thermal) Framing System.
 - 3. System Dimensions: 2" X 4-1/2".
 - 4. Glass: Front.

2.2 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by aluminum storefront 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 alloy and temper.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum framing members, trim hardware, anchors, and other components.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- E. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- F. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 STOREFRONT FRAMING SYSTEM

- A. Thermal Barrier (Trifab™ VG 451T):
 - 1. Kawneer IsoLock™ Thermal Break with a 1/4" (6.4 mm) separation consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
 - a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposes shall be stainless steel.
- D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action

- E. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- F. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

2.4 GLAZING SYSTEMS

- A. Glazing: As specified in Section 088000 - GLAZING.
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

2.5 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: As specified in Section 084229.23 – SLIDING AUTOMATIC ENTRANCES.

2.6 ACCESSORY MATERIALS

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Section 079200 - JOINT SEALANTS.
- B. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30 mil (0.762 mm) thickness per coat.

2.7 FABRICATION

- A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fit joints; make joints flush, hairline and weatherproof.
 - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 6. Provisions for field replacement of glazing.
 - 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

- B. Storefront Framing: Fabricate components for assembly using manufacturer's standard installation instructions.
- C. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finishing:
 - 1. iNTERIOR Storefront System: Kawneer Permanodic™ AA-M10C21A44, AAMA 611, Architectural Class I Color Anodic Coating, Color #40 Dark Bronze.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight framed aluminum storefront system installation.
 - 1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
 - 2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
 - 3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
 - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing aluminum-framed storefront system, accessories, and other components.
- B. Install aluminum-framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.

- D. Install aluminum-framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within aluminum-framed storefront to the exterior.
- E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections.
- B. Testing Services: Provide testing and inspecting of representative storefront areas to determine compliance of installed systems with specified requirements.
- C. Repair or remove Work if test results and inspections indicate that Work does not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance with specified requirements of replaced or additional work.
- E. Aluminum-framed assemblies will be considered defective if they do not pass tests and inspections.
- F. Prepare and submit test and inspection reports.
- G. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

3.4 ADJUSTING, CLEANING, AND PROTECTION

- A. Clean aluminum surfaces immediately after installing aluminum-framed storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 084113

SECTION 084229.23 – SLIDING AUTOMATIC ENTRANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related Sections - The following Sections contain construction related to this Section, or require coordination with this Section:
 - 1. Section 079200 – JOINT SEALANTS.
 - 2. Section 084113 – ALUMINUM FRAMED ENTRANCES AND STOREFRONTS.
 - 3. Section 088000 – GLAZING.

1.2 SUMMARY

- A. This Section includes the following types of automatic entrance doors:
 - 1. Exterior and interior, bi-parting, sliding automatic entrance doors in locations as shown on the Drawings.

1.3 REFERENCE STANDARDS

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. Underwriters Laboratories (UL):
 - 1. **UL 325** – Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems.
- C. American National Standards Institute (ANSI) / Builders' Hardware Manufacturers Association (BHMA):
 - 1. **ANSI/BHMA A156.10**: Standard for Power Operated Pedestrian Doors.
- D. American Society for Testing and Materials (ASTM):
 - 1. **ASTM B221** - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 2. **ASTM B209** - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- E. American Association of Automatic Door Manufacturers (AAADM).

- F. National Fire Protection Association (NFPA):
 - 1. **NFPA 101** – Life Safety Code.
 - 2. **NFPA 70** – National Electric Code.
- G. International Code Council (ICC):
 - 1. **IBC 2021:** International Building Code.
- H. Building Officials and Code Administrators International (BOCA), 1999.
- I. International Conference of Building Officials (ICBO):
 - 1. **UBC 1997:** Uniform Building Code.
- J. International Organization for Standardization (ISO):
 - 1. **ISO 9001** - Quality Management Systems.
- K. National Association of Architectural Metal Manufacturers (NAAMM):
 - 1. Metal Finishes Manual for Architectural and Metal Products.
- L. American Architectural Manufacturers Association (AAMA):
 - 1. **AAMA 608.1** – Voluntary Guide Specification and Inspection Methods for Electrolytically Deposited Color Anodic Finishes for Architectural Aluminum.
 - 2. **AAMA 611** – Voluntary Specification for Anodized Architectural Aluminum.
 - 3. **AAMA 701** – Voluntary Specification for Pile Weatherstripping and Replaceable Fenestration Weatherseals.
- M. Aluminum Association (AA).

1.4 DEFINITIONS

- A. Activation Device: Device that, when actuated, sends an electrical signal to the door operator to open the door.
- B. Safety Device: Device that prevents a door from opening or closing, as appropriate.

1.5 PERFORMANCE REQUIREMENTS

- A. Provide automatic entrance door assemblies capable of withstanding structural loads and thermal movements based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Thermal Movements: Provide automatic entrance doors that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects.

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.
- C. Operating Range: Minus 30 deg F (Minus 34 deg C) to 130 deg F (54 deg C).
- D. Opening-Force Requirements for Egress Doors: Not more than 50 lbf (222 N) required to manually set door in motion if power fails, and not more than 15 lbf (67 N) required to open door to minimum required width.
- E. Closing-Force Requirements: Not more than 30 lbf (133 N) required to prevent door from closing.

1.6 SUBMITTALS

- A. Submit listed submittals in accordance with Section 013300 – SUBMITAL PROCEDURES..
- B. Shop Drawings: Include plans, elevations, sections, details, hardware mounting heights, and attachments to other work. Drawings must be Job Specific.
- C. Finish Samples: Submit samples of bronze anodized finishes for review and approval. Design intent is to match new aluminum storefront finish as closely as possible.
- D. Closeout Submittals:
 1. Owner's Manual.
 2. Warranties.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained for installation and maintenance of units required for this Project.
- B. Manufacturer Qualifications: A qualified manufacturer with a manufacturing facility certified under ISO 9001 and with company certificate issued by AAADM.
- C. Certifications: Automatic sliding door systems shall be certified by the manufacturer to meet performance design criteria in accordance with the following standards:
 1. ANSI/BHMA A156.10.
 2. NFPA 101.
 3. Underwriter's Laboratories UL 325 listed.
 4. IBC.
 5. ICBO.
 6. BOCA.
- D. Source Limitations: Obtain automatic entrance door assemblies through one source from a single manufacturer.

- E. Product Options: Drawings indicate sizes, profiles, and dimensional requirements of automatic entrance door assemblies and are based on the specific system indicated. Refer to Section 016000 - PRODUCT REQUIREMENTS.
- F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to Authorities Having Jurisdiction (AHJ), and marked for intended use.
- G. Emergency-Exit Door Requirements: Comply with requirements of Authorities Having Jurisdiction (AHJ) for automatic entrance doors serving as a required means of egress.

1.8 PROJECT CONDITIONS

- A. Field Measurements: General Contractor shall verify openings to receive automatic entrance door assemblies by field measurements before fabrication and indicate measurements on Shop Drawings.
- B. Mounting Surfaces: General Contractor shall verify all surfaces to be plumb, straight and secure; substrates to be of proper dimension and material.
- C. Other trades: General Contractor shall advise of any inadequate conditions or equipment.

1.9 COORDINATION

- A. Coordinate size and location of recesses in concrete floors for recessed sliding tracks, if indicated. Concrete, reinforcement, and formwork requirements are specified in Section 033000 – CAST-IN-PLACE CONCRETE, as required.
- B. Templates: Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing automatic entrance doors to comply with indicated requirements.
- C. Electrical System Roughing-in: Coordinate layout and installation of automatic entrance door assemblies with connections to power supplies.

1.10 WARRANTY

- A. Automatic Entrance Doors shall be free of defects in material and workmanship for a period of one (1) year from the date of Substantial Completion.
- B. During the warranty period the Owner shall engage a factory-trained technician to perform service and affect repairs. A safety inspection shall be performed after each adjustment or repair and a completed inspection form shall be submitted to the Owner.
- C. During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal working hours.

PART 2 - PRODUCTS

2.1 AUTOMATIC ENTRANCE DOORS

- A. Basis of Design Manufacturer: Stanley Access Technologies; Dura-Glide™ 2000 Series sliding automatic entrance doors.

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 1. Headers, stiles, rails, and frames: 6063-T6.
 - 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
 - 3. Sheet and Plate: ASTM B 209.
- B. Sealants and Joint Fillers: Performed under Section 079200 - JOINT SEALANTS.

2.3 AUTOMATIC ENTRANCE DOOR ASSEMBLIES

- A. Provide manufacturer's standard automatic entrance door assemblies including doors, sidelites, framing, headers, carrier assemblies, roller tracks, door operators, activation and safety devices, and accessories required for a complete installation.
- B. Sliding Automatic Entrance Doors:
 - 1. Bi-Parting sliding doors:
 - a. Configuration: Two sliding leaves with full sidelites.
 - b. Traffic Pattern: Two-way.
 - c. Emergency Breakaway Capability: Sliding leaves only.
 - d. Mounting: Between jambs.
 - e. Auto-lock to tie into Card Reader System, if scheduled.

2.4 COMPONENTS

- A. Framing Members: Manufacturer's standard extruded aluminum reinforced as required to support imposed loads.
 - 1. Nominal Size: 1-¾ inch by 4-½ inch (45 by 115 mm).
- B. Stile and Rail Doors and Sidelites: Manufacturer's standard 1-¾ inch (45 mm) thick glazed doors with extruded-aluminum tubular stile and rail members. Incorporate concealed tie-rods that span full length of top and bottom rails or mechanically fasten corners with reinforcing brackets that are welded.
 - 1. Glazing Stops and Gaskets: Snap-on, extruded-security aluminum stops and preformed gaskets.
 - 2. Stile Design: Narrow stile; 2-inch (51 mm) nominal width.
 - 3. Bottom Rail Design: Minimum 4-inch (102 mm) nominal height.

4. Muntin Bars: Horizontal tubular rail member for each door; 2-inch (51 mm) nominal width.
- C. Glazing: All glazing furnished “by others” shall be 1-inch (25mm) tempered insulated, hermetically sealed for exterior exposure, and ¼-inch (6mm) tempered for interior exposure, unless otherwise specified.”.
- D. Headers: Fabricated from extruded aluminum and extending full width of automatic entrance door units to conceal door operators, carrier assemblies, and roller tracks. Provide hinged or removable access panels for service and adjustment of door operators and controls. Secure panels to prevent unauthorized access.
 1. Mounting: Concealed, with one side of header flush with framing.
 2. Capacity: Capable of supporting doors up to 220 lb (100 kg) per leaf over spans up to 14 feet (4.3 m) without intermediate supports.
- E. Carrier Assemblies and Overhead Roller Tracks: Manufacturer's standard carrier assembly that allows vertical adjustment of at least 1/8-inch; consisting of urethane with precision steel lubricated ball-bearing wheels, operating on a continuous roller track. Support doors from carrier assembly by 2-inch diameter anti-riser wheels with factory adjusted cantilever and pivot assembly. Minimum two ball-bearing roller wheels and two anti-rise rollers for each active leaf.
 1. Minimum Load Wheel Diameter: 2 ½-inch (64 mm).
- F. Thresholds: Manufacturer's standard thresholds as indicated below:
 1. Continuous standard tapered extrusion double bevel.
 2. All thresholds to conform to details and requirements for Code compliance.
- G. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.
- H. Signage: Provide signage in accordance with ANSI/BHMA A156.10.

2.5 DOOR OPERATORS

- A. Provide door operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, operation under normal traffic load for type of occupancy indicated.
- B. Electromechanical Operators: Self-contained overhead unit powered by a minimum of 1/4 horsepower, permanent-magnet DC motor with gear reduction drive, microprocessor controller; and encoder.
 1. Operation: Power opening and power closing.
 2. Features:
 - a. Adjustable opening and closing speeds.
 - b. Adjustable back-check and latching.
 - c. Adjustable braking.

- d. Adjustable hold-open time between 0 and 30 seconds.
 - e. Obstruction recycle.
 - f. On/Off switch to control electric power to operator.
 - g. Energy conservation switch that reduces door-opening width.
 - h. Variable rate open/closed speed control.
 - i. Closed loop speed control with active braking and acceleration.
 - j. Variable obstruction recycle time delay.
 - k. Self adjusting stop position.
 - l. Self adjusting closing compression force.
 - m. Optional Switch to open/Switch to close operation.
- 3. Mounting: Concealed.
 - 4. Drive System: Synchronous belt type.
- C. Electrical service to door operators shall be provided under Division 26 Electrical. Minimum service to be 120 VAC, 5 amps.

2.6 ELECTRICAL CONTROLS

- A. Electrical Control System: Electrical control system shall include a microprocessor controller and position encoder. The encoder shall monitor revolutions of the operator shaft and send signals to microprocessor controller to define door position and speed. Systems utilizing external magnets and magnetic switches are not acceptable. A single controller shall be capable of controlling up to 2 operators per entrance system.
- B. Life Cycle Data Counter: The microprocessor control shall incorporate a non-re-settable counter to track door operation cycles.
- C. Controller Protection: The microprocessor controller shall incorporate the following features to ensure trouble free operation:
- 1. Automatic Reset Upon Power Up.
 - 2. Fuse Protection.
 - 3. Electronic Surge Protection.
 - 4. Internal Power Supply Protection.
 - 5. Software "Watchdog" protection in the case of software malfunction.
- D. Soft Start/Stop: A "soft-start" "soft-stop" motor driving circuit shall be provided for smooth normal opening and recycling.
- E. Safety Search Circuitry: Provide system to recycle the sliding panels when an obstruction is encountered during the closing cycle. If an obstruction is detected, the system shall search for that object on the next closing cycle by reducing door closing speed prior to the previously encountered obstruction location, and will continue to close in check speed until doors are fully closed, at which time the doors will reset to normal speed. If obstruction is encountered again, the door will come to a full stop. The doors shall remain stopped until obstruction is removed and operate signal is given, resetting the door to normal operation.
- F. Programmable Controller: Microprocessor controller shall be programmable and shall be designed for connection to a local configuration tool. Local configuration tool shall be

software driven and shall be utilized via Palm® handheld interface. The following parameters may be adjusted via the configuration tool.

1. Operating speeds and forces as required to meet ANSI/BHMA A156.10.
2. Adjustable and variable features as specified in paragraph 2.05, B., 2.
3. Reduced opening position.
4. Firmware update.
5. Trouble Shooting
 - a. I/O Status.
 - b. Electrical component monitoring including parameter summary.
6. Entrance profile copy/paste.
7. Software for local configuration tool shall be available as a free download from the sliding automatic entrance manufacturer's internet site.

2.7 ACTIVATION AND SAFETY DEVICES

- A. Motion Sensors: Motion sensors shall be mounted on each side of door header to detect pedestrians in the activating zone, and to provide a signal to open doors in accordance with ANSI/BHMA A156.10. Units shall be programmable for bi-directional or uni-directional operation and shall incorporate K-band microwave frequency to detect all motion in both directions.
- B. Presence Sensors: Presence sensors shall be provided to sense people or objects in the threshold safety zone in accordance with ANSI/BHMA A156.10. Units shall be self-contained, fully adjustable, and shall function accordingly with motion sensors provided. The sensor shall be enabled simultaneously with the door-opening signal and shall emit an elliptical shaped infrared presence zone, centered on the doorway threshold line. Presence sensors shall be capable of selectively retuning to adjust for objects which may enter the safety zone; tuning out, or disregarding, the presence of small nuisance objects and not tuning out large objects regardless of the time the object is present in the safety zone. The door shall close only after all sensors detect a clear surveillance field.
- C. Photoelectric Beams: In addition to the threshold sensor include a minimum of two (2) doorway holding beams. Photoelectric beams shall be pulsed infrared type, including sender receiver assemblies for recessed mounting.

2.8 HARDWARE

- A. Provide units in sizes and types recommended by automatic entrance door and hardware manufacturers for entrances and uses indicated.
- B. Emergency Breakaway Feature: Provide release hardware that allows panel(s) to swing out in direction of egress to full 90 degrees from any position in sliding mode. Maximum force to open panel shall be 50 lbf (222 N) according to ANSI/BHMA A156.10. Interrupt powered operation of panel operator while in breakaway mode.
 1. Emergency breakaway feature shall include at least one adjustable detent device mounted in the top of each breakaway panel to control panel breakaway force.

- C. Control Switch: Provide manufacturer's standard header mounted rocker switches to allow for full control of the automatic entrance door. Controls to include, but are not limited to:
 - 1. Power On/Off.
 - 2. Reduced Opening.
 - 3. Open/Closed/Automatic.
- D. Sliding Weather Stripping: Manufacturer's standard replaceable components complying with AAMA 701; made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.
- E. Weather Sweeps: Manufacturer's standard adjustable nylon brush sweep mounted to underside of door bottom.

2.9 FABRICATION

- A. Factory fabricates automatic entrance door assembly components to designs, sizes, and thickness indicated and to comply with indicated standards.
 - 1. Form aluminum shapes before finishing.
 - 2. Use concealed fasteners to greatest extent possible.
 - a. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - b. Reinforce members as required to receive fastener threads.
- B. Framing: Provide automatic entrance doors as prefabricated assemblies.
 - 1. Fabricate tubular and channel frame assemblies with manufacturer's standard mechanical or welded joints. Provide sub-frames and reinforcement as required for a complete system to support required loads.
 - 2. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
 - 3. Form profiles that are sharp, straight, and free of defects or deformations.
 - 4. Prepare components to receive concealed fasteners and anchor and connection devices.
 - 5. Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
- C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.
- D. Door Operators: Factory fabricated and installed in headers, including adjusting and testing.
- E. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated.
- F. Hardware: Factory install hardware to the greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site.

2.10 ALUMINUM FINISHES

- A. Comply with NAAMM Metal Finishes Manual for Architectural and Metal Products for recommendations for applying and designing finishes. Finish designations prefixed by AA comply with system established by Aluminum Association for designing finishes.
- B. Exterior and Interior Sliding Automatic Entrances: Class I, Color Anodic Finish: AA-M12C22A42/A44 Mechanical Finish: as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.70 mils minimum complying with AAMA 611-98. And the following:
 - 1. Color: Dark Bronze.
 - 2. AAMA 606.1.
 - 3. Applicator must be fully compliant with all environmental regulations and permits, including wastewater and heavy metal discharge.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine conditions for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of automatic entrance doors. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Do not install damaged components. Fit frame joints to produce joints free of burrs and distortion. Rigidly secure non-movement joints.
- B. Entrances: Install automatic entrance doors plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
 - 1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
 - 2. Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.
- C. Door Operators: Connect door operators to electrical power distribution system as specified in Sections of Division 26 - ELECTRICAL.
- D. Glazing: Install glazing as specified in Section 088000 – GLAZING.
- E. Sealants: Comply with requirements specified in Section 079200 - JOINT SEALANTS, to provide weather tight installation.

3.3 FIELD QUALITY CONTROL

- A. Testing Services: Factory Trained Installer shall test and inspect each automatic entrance door to determine compliance of installed systems with applicable ANSI standards.

3.4 ADJUSTING

- A. Adjust door operators, controls, and hardware for smooth and safe operation, for weather-tight closure, and complying with requirements in ANSI/BHMA A156.10.

3.5 CLEANING AND PROTECTION

- A. Clean glass and aluminum surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish. Comply with requirements in Section 088000 – GLAZING, for cleaning and maintaining glass.

END OF SECTION 084229.23

SECTION 085619 – PASS-THROUGH WINDOW

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes:
 - 1. Stainless steel interior double-hung pass-through windows in locations as shown on the Drawings.

1.2 SUBMITTALS

- A. Product Data: Submit Manufacturer's technical product data substantiating that products comply.
- B. Shop drawings: Submit for fabrication and installation of windows. Include details, elevations and installation requirement of finish hardware and cleaning.
- C. Certification: Provide printed data in sufficient detail to indicate compliance with the Contract Documents.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver windows crated to provide protection during transit and job storage.
- B. Inspect windows upon delivery for damage. Unless minor defects can be made to meet the Architect's specifications and satisfaction, damaged parts shall be removed and replaced.
- C. Store windows at building site under cover in dry location.

1.4 PROJECT CONDITIONS

- A. Field measurements: Check opening by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

1.5 WARRANTY

- A. All material and workmanship shall be warranted against defects for a period of two (2) years for labor and six (6) for parts from the original date of purchase.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER'S

- A. Basis of Design Manufacturer: Continental Metal Products, Corporation, Inc. Healthcare Division, 35 Olympia Avenue, Woburn, MA 01801. (781) 935-4400, (800) 221-4439, www.continentalmetal.com, sales@continentalmetal.com.

2.2 PASS-THROUGH WINDOW ASSEMBLY

- A. Basis of Design: Model PTW-2436 BW double hung pass-through window with counter balanced sash, constructed with removable stainless steel frame and ¼-inch thick clear tempered safety glass window panes having the following features:
1. Construction: Pass-Through Window assembly shall be constructed entirely of Type 304 stainless steel polished to a No. 4 finish. Nominal frame size shall be 24-inches wide x 36-inches high, with clear pass-through opening size of 22-inches wide x 13-¾-inches high.
 2. Wall Frame: Frame shall be constructed of No. 16 gauge stainless steel with welded corners, ground and polished smooth. Frame shall be telescoping for easy installation into wall. Depth of the frame shall be determined by wall thickness as shown on the Drawings.
 3. Options: Provide Pass-Through Window Assembly with the following options:
 - a. Fire-rated option with Failsafe Activation.
 - b. Locks.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install window in accordance with manufacturer's printed instructions and recommendations. Repair damaged units as directed (if approved by the manufacturer and the Architect) or replace with new unit.

3.2 CLEANING

- A. Clean frame and glazing surfaces after installation, complying with requirements contained in the manufacturer's instructions. Remove excess glazing sealant compounds, dirt or other substances.

3.3 PROTECTION

- A. Maintain protective measures required throughout the remainder of the construction period to ensure that the window does not incur any damage or deterioration, other than normal weathering, at the time of Substantial Completion.

END OF SECTION 085619

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Sliding doors.
 - 3. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Electromechanical door hardware.
 - 3. Automatic operators.
 - 4. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Section 081416 – ARCHITECTURAL WOOD DOORS.
 - 2. Section 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.
 - 3. Section 087113 - AUTOMATIC DOOR OPERATORS.
 - 4. Section 130900 - RADIATION PROTECTION: for lead lined doors and frames.
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
 - 8. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

- C. Shop Drawings: Details of electrified access control hardware indicating the following:
 - 1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
 - a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
 - b. Complete (risers, point-to-point) access control system block wiring diagrams.
 - c. Wiring instructions for each electronic component scheduled herein.
 - 2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- E. Informational Submittals:
 - 1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

1.4 CLOSEOUT SUBMITTALS

- A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Section 017700 – PROJECT CLOSEOUT.
- B. Project Record Documents: Provide record documentation of as-built door hardware sets in digital format (.pdf, .docx, .xlsx, .csv) and as required in Section 013200 – CONSTRUCTION PROGRESS DOCUMENTATION.

1.5 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
 - 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.
- G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.
- H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.

3. Review sequence of operation narratives for each unique access controlled opening.
 4. Review and finalize construction schedule and verify availability of materials.
 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.7 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.8 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
 2. Faulty operation of the hardware.
 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 4. Electrical component defects and failures within the systems operation.
- C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 BUTT HINGES

- A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for all out-swinging lockable doors.
 5. Basis of Design Manufacturers:
 - a. McKinney (MK) - TA/T4A Series, 5-knuckle.

2.2 FLOOR CLOSERS AND PIVOTS

A. Pivots: ANSI/BHMA A156.4, Grade 1; space intermediate pivots equally not less than 25 inches on center apart or not more than 35 inches on center for doors over 121 inches high. Pivot hinges to have oil impregnated bronze bearing in the top pivot and a radial roller and thrust bearing in the bottom pivot with the bottom pivot designed to carry the full weight of the door. Pivots to be UL listed for windstorm where applicable.

1. Basis of Design Manufacturers:

a. Norton Rixson (RF).

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets with a 1-year warranty. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Basis of Design Manufacturers:

a. McKinney (MK) - QC (# wires) Option.

B. Electrified Quick Connect Intermediate Transfer Pivots: Provide electrified offset intermediate transfer pivot hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Basis of Design Manufacturers:

a. Norton Rixson (RF) - E-M19-QC (# wires).

C. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Basis of Design Manufacturers:

a. Pemko (PE) - EL-CEPT Series.

b. Securitron (SU) - EL-CEPT Series.

- D. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.
1. Provide one each of the following tools as part of the base bid contract:
 - a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
 - b. McKinney (MK) - Connector Hand Tool: QC-R003.
 2. Basis of Design Manufacturers:
 - a. McKinney (MK) - QC-C Series.

2.4 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.
1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
 2. Furnish dust proof strikes for bottom bolts.
 3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
 4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
 5. Basis of Design Manufacturers:
 - a. Rockwood (RO).
- B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 4. Pulls, where applicable, shall be provided with a 10" clearance from the finished floor on the push side to accommodate wheelchair accessibility.

5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets. When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
6. Basis of Design Manufacturers:
 - a. Rockwood (RO).

2.5 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
 1. Basis of Design Manufacturers:
 - a. dormakaba BEST (BE).
- B. Small Format Interchangeable Cores: Provide small format interchangeable cores (SFIC) as specified, core insert, removable by use of a special key; usable with other manufacturers' cylinders.
- C. Keying System: Each type of lock and cylinders to be factory keyed.
 1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 3. Existing System: Field verify and key cylinders to match Owner's existing system.
- D. Key Quantity: Provide the following minimum number of keys:
 1. Change Keys per Cylinder: Two (2)
 2. Master Keys (per Master Key Level/Group): Five (5).
 3. Construction Keys (where required): Ten (10).
- E. Construction Keying: Provide construction master keyed cylinders.
- F. Key Registration List (Bitting List):
 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 MORTISE LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Basis of Design Manufacturers:

a. Corbin Russwin Hardware (RU) - ML2000 Series.

2.7 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.8 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
 - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
 7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 9. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.
1. Provide exit devices with functions and features as follows:
 - a. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.
 - b. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
 - c. No catch points: addition of applied deflectors or other added components are not allowed.
 - d. No visible plastic.
 - e. Heavy duty end caps with flush and overlapping options made of stainless steel, brass, or bronze with architectural finishes.
 - f. Constructed of all stainless steel.
 - g. Stainless steel pullman type latch with deadlock feature.
 - h. Narrow or wide style exterior trim as specified in the hardware sets.
 - i. Center case adjustability on concealed vertical rod exit devices; single operation with hex key individually adjusts top or bottom latches. No retainer screws or clips required to maintain adjustment.
 - j. Ten-year limited warranty for mechanical features.
 2. Electromechanical exit devices shall have the following functions and features:
 - a. Universal Molex plug-in connectors that have standardized color-coded wiring and are field configurable in fail safe or fail secure and operate from 12vdc to 24vdc regulated.

- b. Wire routing for all non-access control electromechanical functions and EcoFlex trim to be contained within the carrier of the device eliminating the need for cavities in doors to be drilled. Include a protective film so that wires don't get damaged if the rail needs to be removed.
 - c. EcoFlex or equivalent technology that reduces energy consumption up to 92% as certified by GreenCircle.
 - d. Options to be available for request-to-exit or enter signaling, latchbolt and touchbar monitoring.
 - e. Field configurable electrified trim to fail-safe or fail-secure that operates from 12-24VDC.
3. Basis of Design Manufacturers:
- a. Corbin Russwin Hardware (RU) - PED4000 / PED5000 Series.

2.9 SURFACE DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
- 1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
 - 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 - 3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
 - 4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 - 5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
 - 6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.
- 1. Basis of Design Manufacturers:
 - a. Norton Rixson (NO) - 9500 Series.

- C. Door Closers, Surface Mounted (Cam Action): ANSI/BHMA 156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, high efficiency door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be of the cam and roller design, one piece cast aluminum silicon alloy body with adjustable backcheck and independently controlled valves for closing sweep and latch speed.
 - 1. Basis of Design Manufacturers:
 - a. Norton Rixson (NO) - 2800ST Series.

2.10 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 - 1. Basis of Design Manufacturers:
 - a. Rockwood (RO).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
 - 1. Basis of Design Manufacturers:
 - a. Norton Rixson (RF).

2.11 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are 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.
 - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Basis of Design Manufacturers:
 - 1. Pemko (PE).

2.12 ELECTRONIC ACCESSORIES

- A. Push-Button Switches: Industrial grade momentary or alternate contact, back-lighted push buttons with stainless-steel switch enclosures. 12/24 VDC bi-color illumination suitable for either flush or surface mounting.
 - 1. Basis of Design Manufacturers:
 - a. Alarm Controls (AK) - TS Series.
 - b. Securitron (SU) - PB Series.
- B. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.
 - 1. Basis of Design Manufacturers:
 - a. Securitron (SU) - DPS Series.
- C. Intelligent Switching Power Supplies: Provide the least number of power supplies at the appropriate amperage level sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
 - 1. Power supplies shall meet all functions and features as specified herein.
 - a. UL listed dual voltage 12 or 24 VDC field selectable continuous output.

- b. Dedicated fast charger to prolong battery life with low battery cutoff to protect batteries from deep discharge.
- c. Enhanced surge immunity for input/output protection
- d. Separate, dedicated battery charging circuit to keep locks cooler.
- e. Dual-color LED visual notification to prevent applying incorrect voltages to the power supply.
- f. Instant auto-switch to battery on AC loss.
- g. Expandable up to 16 outputs in the standard enclosure
- h. Integrated fire alarm interface to allow main output shutdown or disconnect on a per output basis when using an R8 output module.
- i. Network ready and remotely manage locks and connected devices when using an M8 managed output module on network models.
- j. Lifetime replacement, no-fault, no questions asked warranty.

2. Basis of Design Manufacturers:

- a. Life Safety Power (LP).
- b. Securitron (SU) - AQL Series.

2.13 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.14 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify Architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
- E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
 - 1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 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.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should 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 and functionality.
 - 1. Quantities listed are for each pair of doors, or for each single door.
 - 2. The supplier is responsible for handling and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

B. Manufacturer's Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. RF - Rixson
4. SU - Securitron
5. RO - Rockwood
6. RU - Corbin Russwin
7. BE - BEST Locks & Closers
8. HS - HES
9. NO - Norton
10. HI - Hiawatha
11. LU - Lund Equipment Co

Hardware Sets

Set: 1.0

Doors: 101A, 101B

Description: AUTO SLIDING CYLINDER ONLY

2 Mortise Cylinder	1E-74 type as req'd	626	BE 087100
1 Hardware By Others	Hardware By Door Supplier		

Set: 2.0

Doors: 402-402A (ONE PAIR OF DOORS) , 418 (ONE SLIDING DOOR)

Description: BIPARTING DIRTT SLIDING GLASS DOOR SYSTEM

1 DIRTT DOORS	Locking hardware by door supplier, match keying of new product where applicable
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Set: 3.0

Doors: 436A, 436B, 436C

Description: ALL BY PROPBARMA DOOR PROVIDER

1 Mortise Cylinder	1E-74 type as req'd	626	BE 087100
1 Hardware By Others	Hardware By Door Supplier		

Set: 4.0

Doors: 400B

Description: ELEC TRIM RIM EXIT CAM CLOSER GASKET FAIL SAFE RATED

2 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 NRP FT 4-1/2" x 4-1/2"	US26D	MK	087100	
1 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 QC12 FT 4-1/2" x 4-1/2"	US26D	MK	087100	⚡
1 Electrified Rim Exit	PED52903 A N9903PT M92 CT6/7SD	630	RU	087100	⚡
1 Core	1C6/71	626	BE	087100	
1 Surface Closer	2800ST	689	NO	087100	
1 Wall Stop	RM861	US32D	RO	084126	
1 Gasketing	S88D		PE	087100	
1 ElectroLynx Harness	QC-hinge/strike/ or power transfer to ceiling		MK	087100	⚡
1 ElectroLynx Harness	QC- (size to door width/hardware)		MK	087100	⚡
1 Position Switch	DPS		SU	087100	⚡
1 Power Supply	AQL appropriate to hardware requirements		SU	087100	⚡
1 CARD READER	Wall Reader to be provided by Division 28.				

Notes: ACCESS BY AUTHORIZED CARD CREDENTIAL OR MANUAL KEY. ALWAYS FREE EGRESS. FAIL SAFE

Set: 5.0

Doors: 406, 435

Description: RIM EXIT MELR AUTO OPERATOR REMOTE RELEASE GASKET

3 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 NRP FT 4-1/2" x 4-1/2"	US26D	MK	087100	
1 Electric Power Transfer	EL-CEPT	630	SU	087100	⚡
1 Rim Exit Device	PED5247 MELR N947PT M92 CT6/7SD	630	RU	087100	⚡
1 Core	1C6/71	626	BE	087100	
1 Automatic Opener	6331	689	NO	087113	⚡
1 Wall Stop	RM861	US32D	RO	084126	
1 Gasketing	S88D		PE	087100	

1 ElectroLynx Harness	QC-hinge/strike/ or power transfer to ceiling	MK 087100	⚡
1 ElectroLynx Harness	QC- (size to door width/hardware)	MK 087100	⚡
1 Position Switch	DPS	SU 087100	⚡
2 Wall Switch, touchless	700	NO 087113	⚡
1 Pushbutton	PB3ER	SU 087100	⚡
1 Power Supply	AQL appropriate to hardware requirements	SU 087100	⚡
1 CARD READER	Wall Reader to be provided by Division 28.		

Notes: ACCESS BY AUTHORIZED CARD CREDENTIAL OR MANUAL KEY. PROGRAM ACTUATOR SWITCHES AS DIRECTED BY SECURITY FOR ACCESS CONTROL TIMES OR BY CARD READER ACTIVATION. ALWAYS FREE EGRESS. REMOTE RELEASE.

Set: 6.0

Doors: 432

Description: CARD READER LOCK CAM CLOSER GASKET RATED

2 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 FT 4-1/2" x 4-1/2"	US26D	MK 087100	
1 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 QC12 FT 4-1/2" x 4-1/2"	US26D	MK 087100	⚡
1 Fail Secure Lock	ML20906-SEC NSA M92 CT6/7SD	626	RU 087100	⚡
1 Core	1C6/71	626	BE 087100	
1 Surface Closer	2800ST	689	NO 087100	
1 Gasketing	S88D		PE 087100	
1 ElectroLynx Harness	QC-hinge/strike/ or power transfer to ceiling		MK 087100	⚡
1 ElectroLynx Harness	QC- (size to door width/hardware)		MK 087100	⚡
1 Position Switch	DPS		SU 087100	⚡
1 Power Supply	AQL appropriate to hardware requirements		SU 087100	⚡
1 CARD READER	Wall Reader to be provided by Division 28.			

Notes: ACCESS BY AUTHORIZED CARD CREDENTIAL OR MANUAL KEY. ALWAYS FREE EGRESS.

Set: 7.0

Doors: 404, 415

Description: CARD READER LOCK CLOSER RATED GASKET

2 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 FT 4-1/2" x 4-1/2"	US26D	MK	087100	
1 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 QC12 FT 4-1/2" x 4-1/2"	US26D	MK	087100	⚡
1 Fail Secure Lock	ML20906-SEC NSA M92 CT6/7SD	626	RU	087100	⚡
1 Core	1C6/71	626	BE	087100	
1 Surface Closer	9500	689	NO	087100	
1 Wall Stop	RM861	US32D	RO	084126	
1 Gasketing	S88D		PE	087100	
1 ElectroLynx Harness	QC-hinge/strike/ or power transfer to ceiling		MK	087100	⚡
1 ElectroLynx Harness	QC- (size to door width/hardware)		MK	087100	⚡
1 Position Switch	DPS		SU	087100	⚡
1 Power Supply	AQL appropriate to hardware requirements		SU	087100	⚡
1 CARD READER	Wall Reader to be provided by Division 28.				

Notes: ACCESS BY AUTHORIZED CARD CREDENTIAL OR MANUAL KEY. ALWAYS FREE EGRESS.

Set: 8.0

Doors: 430

Description: CARD READER LOCK CLOSER GASKET RATED

2 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 FT 4-1/2" x 4-1/2"	US26D	MK	087100	
1 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 QC12 FT 4-1/2" x 4-1/2"	US26D	MK	087100	⚡
1 Fail Secure Lock	ML20906-SEC NSA M92 CT6/7SD	626	RU	087100	⚡
1 Core	1C6/71	626	BE	087100	
1 Surface Closer	9500	689	NO	087100	
1 Wall Stop	RM861	US32D	RO	084126	
1 Gasketing	S88D		PE	087100	

1 ElectroLynx Harness	QC-hinge/strike/ or power transfer to ceiling	MK 087100	⚡
1 ElectroLynx Harness	QC- (size to door width/hardware)	MK 087100	⚡
1 Position Switch	DPS	SU 087100	⚡
1 Power Supply	AQL appropriate to hardware requirements	SU 087100	⚡
1 CARD READER	Wall Reader to be provided by Division 28.		

Notes: ACCESS BY AUTHORIZED CARD CREDENTIAL OR MANUAL KEY. ALWAYS FREE EGRESS.

Set: 9.0

Doors: 425

Description: LEAD LINED CARD READER LOCK CAM CLOSER GASKET WIDE

1 Pivot Set	147	626	RF 087100	
1 Electrified Inter Pivot	EM19 QC-12	626	RF 087100	⚡
1 Fail Secure Lock	ML20906-SEC NSA M29 M92 CT6/7SD	626	RU 087100	⚡
1 Core	1C6/71	626	BE 087100	
1 Surface Closer	2800ST	689	NO 087100	
1 Gasketing	S88D		PE 087100	
1 ElectroLynx Harness	QC-hinge/strike/ or power transfer to ceiling	MK 087100	⚡	
1 ElectroLynx Harness	QC- (size to door width/hardware)	MK 087100	⚡	
1 Position Switch	DPS	SU 087100	⚡	
1 Power Supply	AQL appropriate to hardware requirements	SU 087100	⚡	
1 CARD READER	Wall Reader to be provided by Division 28.			

Notes: ACCESS BY AUTHORIZED CARD CREDENTIAL OR MANUAL KEY. ALWAYS FREE EGRESS.

Set: 10.0

Doors: 436

Description: CARD READER LOCK CLOSER GASKET 2/DOOR VIEWERS

2 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 FT 5" x 4-1/2"	US26D	MK	087100	
1 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 QC12 FT 5" x 4-1/2"	US26D	MK	087100	⚡
1 Fail Secure Lock	ML20906-SEC NSA M92 CT6/7SD	626	RU	087100	⚡
1 Core	1C6/71	626	BE	087100	
1 Surface Closer	9500	689	NO	087100	
1 Wall Stop	RM861	US32D	RO	084126	
1 Gasketing	S88D		PE	087100	
1 ElectroLynx Harness	QC-hinge/strike/ or power transfer to ceiling		MK	087100	⚡
1 ElectroLynx Harness	QC- (size to door width/hardware)		MK	087100	⚡
1 Position Switch	DPS		SU	087100	⚡
1 Power Supply	AQL appropriate to hardware requirements		SU	087100	⚡
1 CARD READER	Wall Reader to be provided by Division 28.				
2 Viewer	621	CRM	RO	087100	

Notes: 2

ACCESS BY AUTHORIZED CARD CREDENTIAL OR MANUAL KEY. ALWAYS FREE EGRESS.

Set: 11.0

Doors: 431A

Description: PAIR CARD READER LOCK MFB OH STOP CLP CLOSER GASKET RATED

5 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 NRP FT 4-1/2" x 4-1/2"	US26D	MK	087100	
1 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 QC12 FT 4-1/2" x 4-1/2"	US26D	MK	087100	⚡
2 Flush Bolt	555/557 per dr mtrl	US26D	RO	087100	
1 Dust Proof Strike	570	US26D	RO	087100	
1 Fail Secure Lock	ML20906-SEC NSA M92 CT6/7SD	626	RU	087100	⚡
1 Core	1C6/71	626	BE	087100	
1 Surf Overhead Stop	10-X36	630	RF	087100	

1 Surface Closer	CLP9500	689	NO 087100	
1 Astragal	S772D		PE 087100	
1 Gasketing	S88D		PE 087100	
1 ElectroLynx Harness	QC-hinge/strike/ or power transfer to ceiling		MK 087100	⚡
1 ElectroLynx Harness	QC- (size to door width/hardware)		MK 087100	⚡
2 Position Switch	DPS		SU 087100	⚡
1 Power Supply	AQL appropriate to hardware requirements		SU 087100	⚡
1 CARD READER	Wall Reader to be provided by Division 28.			

Notes: ACCESS BY AUTHORIZED CARD CREDENTIAL OR MANUAL KEY. ALWAYS FREE EGRESS.

Set: 12.0

Doors: 400A

Description: RIM PASSAGE EXIT DEVICE CAM CLOSER GASKET RATED

3 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 FT 4-1/2" x 4-1/2"	US26D	MK 087100	
1 Rim Exit Device	PED5210 A N910PT	630	RU 087100	
1 Surface Closer	2800ST	689	NO 087100	
1 Wall Stop	RM861	US32D	RO 084126	
1 Gasketing	S88D		PE 087100	

Set: 13.0

Doors: 413, 423

Description: OFFICE LOCK CAM CLOSER GASKET

3 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 FT 4-1/2" x 4-1/2"	US26D	MK 087100	
1 Office Lock	ML2051 NSA CT6/7SD	626	RU 087100	
1 Core	1C6/71	626	BE 087100	
1 Surface Closer	2800ST	689	NO 087100	
1 Gasketing	S88D		PE 087100	

Set: 14.0

Doors: 408

Description: OFFICE LOCK CLOSER FS GASKET

3 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 FT 4-1/2" x 4-1/2"	US26D	MK	087100
1 Office Lock	ML2051 NSA CT6/7SD	626	RU	087100
1 Core	1C6/71	626	BE	087100
1 Floor Door Stop, short	RM850 (flat top)	US32D	RO	084126
1 Gasketing	S88D		PE	087100
1 Closer	9500	689	NO	087100

Set: 15.0

Doors: 419, 420, 421, 426, 427, 428

Description: OFFICE LOCK CLOSER GASKET

3 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 FT 4-1/2" x 4-1/2"	US26D	MK	087100
1 Office Lock	ML2051 NSA CT6/7SD	626	RU	087100
1 Core	1C6/71	626	BE	087100
1 Wall Stop	RM861	US32D	RO	084126
1 Gasketing	S88D		PE	087100
1 Closer	9500	689	PE	087100

Set: 16.0

Doors: 429

Description: STOREROOM LOCK CLOSER GASKET RATED

3 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 FT 4-1/2" x 4-1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA CT6/7SD	626	RU	087100
1 Core	1C6/71	626	BE	087100
1 Surface Closer	9500	689	NO	087100
1 Wall Stop	RM861	US32D	RO	084126
1 Gasketing	S88D		PE	087100

Set: 17.0

Doors: 433, 434

Description: STOREROOM LOCK PR CLOSER GASKET

3 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 NRP FT 4-1/2" x 4-1/2"	US26D	MK	087100
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1 Storeroom Lock	ML2057 NSA CT6/7SD	626	RU	087100
1 Core	1C6/71	626	BE	087100
1 Surface Closer	PR9500	689	NO	087100
1 Wall Stop	RM861	US32D	RO	084126
1 Gasketing	S88D		PE	087100

Set: 18.0

Doors: 424A

Description: STOREROOM LOCK CLP CLOSER GASKET RATED

3 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 NRP FT 4-1/2" x 4-1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA CT6/7SD	626	RU	087100
1 Core	1C6/71	626	BE	087100
1 Surface Closer	CLP9500	689	NO	087100
1 Gasketing	S88D		PE	087100

Set: 19.0

Doors: 431B, 424B, 435A

Description: PAIR STOREROOM LOCK MFB OH STOP CLP CLOSER GASKET

6 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 NRP FT 4-1/2" x 4-1/2"	US26D	MK	087100
1 Flush Bolt	555/557 per dr mtrl	US26D	RO	087100
1 Dust Proof Strike	570	US26D	RO	087100
1 Storeroom Lock	ML2057 NSA CT6/7SD	626	RU	087100
2 Surf Overhead Stop	10-X36	630	RF	087100
2 Surface Closer	CLP9500	689	NO	087100
1 Gasketing	S88D		PE	087100

Set: 20.0 – NOT USED

Set: 21.0

Doors: 403, 407, 409, 425A

Description: PRIVACY W/INDICATOR CLOSER GASKET

3 Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 FT 4-1/2" x 4-1/2"	US26D	MK	087100
1 Privacy Lock	ML2030 NSA V20	626	RU	087100
1 Wall Stop	RM861	US32D	RO	084126
1 Gasketing	S88D		PE	087100
1 Closer	9500		NO	087100

END OF SECTION 087100

SECTION 087113 - AUTOMATIC DOOR OPERATORS

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. Low energy automatic door operators for swinging doors in locations as shown and specified on the Drawings.

- B. Related Sections: The following Sections and Division contain construction relating to the Section, or require coordination with this Section:

- 1. Section 081250 – INTERIOR ALUMINUM DOOR FRAMES.
 - 2. Section 081416 – ARCHITECTURAL WOOD DOORS.
 - 3. Section 087100 – DOOR HARDWARE.
 - 4. Division 26 – ELECTRICAL.

- C. Codes and Standards: Comply with the version year adopted by the Authority Having Jurisdiction (AHJ).

- 1. American National Standards Institute (ANSI):

- a. **ANSI A117.1** – Accessible and Useable Buildings and Facilities.

- 2. American National Standards Institute (ANSI)/Builders Hardware Manufacturers Association (BHMA):

- a. **ANSI/BHMA A156.19** – Power Assist and Low-Energy Power Operated Doors.

- 3. 2021 Arkansas Fire Prevention Code (2021 International Building Code (IBC)).

- 4. National Fire Protection Association (NFPA):

- a. **NFPA 70** – National Electrical Code.
 - b. **NFPA 80** – Fire Doors and Windows.

- 5. Underwriters Laboratories (UL):

- a. **UL 325** – Standard for Safety: Door, Drapery, Gate, Louver, and Window Operators and Systems.

1.3 PERFORMANCE REQUIREMENTS

- A. Automatic door operators to be used on interior doors; up to 200 pounds (91 kg) weight and maximum door width of 48" (1219 mm).
 - 1. Auto door operator capable of operating within temperature ranges of -22°F (-30°C) and 122°F (50°C).

1.4 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, and finishes for automatic door operators, including activation devices. Include operating characteristics, electrical characteristics, and furnished accessories.
- B. Shop Drawings: Include details and attachments to other work.
 - 1. Include locations and elevations of each unique entrance showing activation devices.
 - 2. Indicate required clearances, components, and location and size of field connections.
 - 3. Wiring Diagrams: For power, signal, and activation wiring.
- C. Qualification Data: Provide copy of manufacturer's official certification or accreditation document indicating proof of status as a qualified and authorized installer of automatic door operators and accessories.
- D. Operating and Maintenance Manuals: Provide manufacturer's operating and maintenance manual for each item comprising the automatic door operator installation in quantity as required in Section 017700 – PROJECT CLOSEOUT. The manual to include the name, address, and contact information of the manufacturer and Installer providing the operators and installation. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
- E. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project.
- B. Certified Installer Qualifications: Power operator products and accessories are required to be supplied and installed through the Norton Preferred Installer (NPI) program. Suppliers are to be factory trained, certified, and a direct purchaser of the specified power operators and be responsible for the installation and maintenance of the units and accessories indicated for the Project.
- C. Source Limitations: Obtain automatic door operators, including activation devices, from single source, qualified supplier unless otherwise indicated.

- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a testing agency, and marked for intended location and application.
- E. Exit Door Requirements: Comply with requirements of Authorities Having Jurisdiction (AHJ) for doors with automatic door operators serving as a component of a required means of egress.
- F. Fire Rated Door Assemblies: Provide operators for fire rated door assemblies that are listed and labeled by a testing and inspecting agency acceptable to Authorities Having Jurisdiction (AHJ) for use on types and sizes of labeled fire doors required.
- G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Section 013100 – PROJECT MANAGEMENT AND COORDINATION with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and the procedures for receiving, handling, and installing automatic door operators.
 - 1. Prior to installation of automatic door operators, arrange for certified Installer's representative to conduct a project specific meeting to review the installation and maintenance of their respective products. Project meeting to be attended by representatives of related trades furnishing and installing the aluminum, hollow metal and wood doors sections.
 - 2. Review and finalize construction schedule and verify availability of materials.

1.6 COORDINATION

- A. Electrical Systems Coordination: Coordinate the layout and installation of scheduled automatic door operators and related activation devices, with required connections to source power junction boxes, remote power supplies, access control equipment, detection and monitoring hardware, and fire alarm system.
- B. Templates: Obtain and distribute to the parties involved, templates for doors, frames, operators, and other work specified to be factory prepared and reinforced for installing automatic door operators. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing automatic door operators to comply with indicated requirements.
- C. Door and Frame Preparation: Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified automatic door operators without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

- B. Special Warranty: Written warranty, executed by manufacturer, agreeing to repair or replace components of automatic door operators that fail in materials or workmanship within specified warranty period after final acceptance by Owner. Failures include, but are not limited to, the following:
 - 1. Faulty or sporadic operation of automatic door operator, including activation and safety devices.
 - 2. Deterioration of metals, metal finishes, and other materials beyond normal weathering or use.
- C. Special Warranty Period: Two years from date of Substantial Completion.
- D. Provide extended warranty from defects in material or workmanship under normal use for a period of 3 years from the date of substantial completion for units installed by a certified ASSA ABLOY Power Operator Preferred Installer in accordance with the manufacturer's written warranty certificate.

1.8 MAINTENANCE SERVICE

- A. Maintenance Service: Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance by skilled employees of automatic door operator Installer. Include planned and preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door operation. Provide parts and supplies the same as those used in the manufacture and installation of original equipment.
- B. Extended Maintenance Support and Service Agreement: Submit for Owner's consideration an optional extended Service Agreement for the installed automatic door operator system. The extended Service Agreement is considered elective and is without manufacturer's requirement stipulating mandatory coverage for owner and/or vendor system support.
 - 1. A published copy of this agreement to be included with the submittal package
 - 2. Support for the installed automatic door operator system is provided through the vendor under a specified, limited 24 hour support program.
 - 3. Automatic door operators and components are to be available on a one-day turn around time frame from the vendor.

PART 2 - PRODUCTS

2.1 ELECTROMECHANICAL DOOR OPERATORS

- A. General: Provide low energy operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.
 - 1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.
- B. Standard: Certified ANSI/BHMA A156.19.

- C. Performance Requirements:
 - 1. Opening Force if Power Fails: Not more than 15 lbf required to release a latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
 - 2. Entrapment Protection: Not more than 15 lbf required to prevent stopped door from closing or opening.
- D. Configuration: Surface mounted as required. Door operators to control single swinging and pair of swinging doors.
- E. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guideline. Provide time delay for door to remain open before initiating closing cycle as required by ANSI/BHMA A156.19.
- F. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.
- G. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.
- H. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.
- I. Basis of Design Manufacturer: Subject to compliance with requirements, provide products by the following:
 - 1. Norton Door Controls (NO) - 6300 Series.

2.2 ACTIVATION DEVICES

- A. General: Provide activation devices in accordance with ANSI/BHMA A156.19 standard, for condition of exposure indicated and for long term, maintenance free operation under normal traffic load operation. Coordinate activation control with electrified hardware and access control interfaces. Activation switches are standard SPST, with optional DPDT availability.
- B. Touch Less Wall Switch: Momentary contact door control switch with movement required activation. Single or double gang box junction box mounting.
 - 1. Doppler radar sensor.
 - 2. Mounting Location: As indicated on Drawings.
 - 3. Basis of Design Manufacturer:
 - a. Norton Door Controls (NO) – 700 Series.

- C. Key Switch: Key controlled actuator device enclosed in single or double gang junction box.
 - 1. Faceplate Material: Stainless steel.
 - 2. Functions: On-off, maintained contact.
 - 3. Two-way Mounting: Recess or surface mounting as indicated on Drawings.
 - 4. Basis of Design Manufacturer:
 - a. Securitron (SU) – MKA Series.

2.3 ACCESSORIES

- A. Signage: As required by cited ANSI/BHMA A156.19 standard for the type of operator.

2.4 FINISHES

- A. Standard: Designations used to indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware. Units will be sprayed with a combination of waterborne acrylic and polyester powder coat.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.5 OPENING LABELS

- A. Provide 1"W x 2"H gloss polyester label imprinted with door mark and QR-type code readable via IR and visible light scan. QR code links to a security credential protected site displaying the installed door opening information. Label constructed with a high-performance, permanent acrylic adhesive resistant to chemicals, smear and scratch, and repeated freeze and thaw cycles. Face stock of label to be white or clear coated, 2.0 mil thickness with tensile strength meeting or exceeding 18,000 psi.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, door and frame preparation and reinforcements, power connections, electrical systems interfaces, and other conditions affecting performance of automatic door operators.
- B. Notify Architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 INSTALLATION

- A. General: Install complete automatic door operators according to manufacturer's written instructions and ANSI/BHMA A156.19 standard, including activation devices, control wiring, remote power units if any, connection to the building's fire alarm system, and required signage.
- B. Power Connection: Reference Division 26 "Electrical" Sections for connection to electrical power distribution system.
- C. Access Control System: Coordinate connections and operation with access control system, if specified.
- D. Signage: Apply signage as required by ANSI/BHMA A156.19 standard for type of door operator and direction of pedestrian travel.

3.3 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Section 017700 – PROJECT CLOSEOUT
Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
 - 1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.
 - 2. Submit documentation of incomplete items in the following formats:
 - a. PDF electronic file.
 - b. Electronic formatted file integrated with the Openings Studio™ door opening management software platform.

3.4 ADJUSTING

- A. Comply with requirements of ANSI/BHMA A156.19 standard. Adjust automatic door operators to function smoothly, and lubricate as recommended by manufacturer.

3.5 DEMONSTRATION

- A. Certified Installer's representative to provide eight (8) hours of training to Owner's maintenance personnel in the proper adjustment, operation, and maintenance of automatic door operators.

END OF SECTION 087113

SECTION 088000 – GLAZING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Provide all glass and glazing, complete in place, as shown and scheduled on the Drawings, specified herein, and needed for a complete and proper installation.
- B. Design Intent: Glazing for new exterior automatic sliding door at new Vestibule 101 is intended to match existing building's bronze tinted insulated glass as closely as possible. See paragraph 1.5.B.2 below for special submittal requirements.

1.2 RELATED SECTIONS - The following Sections contain construction or products relating to this Section, or require coordination with this Section:

- A. Section 081250 – INTERIOR ALUMINUM DOOR FRAMES.
- B. Section 081416 – ARCHITECTURAL WOOD DOORS.
- C. Section 084113 – ALUMINUM FRAMED ENTRANCES AND STOREFRONTS.
- D. Section 084229.23 – SLIDING AUTOMATIC ENTRANCES.
- E. Section 088117 – FIRE-RATED GLAZING.
- F. Section 130900 – RADIATION PROTECTION.

1.3 REFERENCE STANDARDS

- A. American National Standards Institute (ANSI):
 - 1. **ANSI Z97.1** – American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- B. American Society for Testing & Materials (ASTM):
 - 1. **ASTM C1036** – Standard Specification for Flat Glass.
 - 2. **ASTM C1048** – Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
 - 3. **ASTM E2190** – Standard Specification for Insulating Glass Unit Performance and Evaluation.
- C. Flat Glass Marketing Association (FGMA).
- D. Insulating Glass Certification Council (IGCC).

1.4 QUALITY ASSURANCE

- A. Standards: Comply with the following standards:

1. All applicable City, State, and Federal Codes, Ordinances, and Regulations.
- B. Qualifications of Installers: Use adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the special requirements and the methods needed for proper performance of the work of this section.
- C. Manufacturers: Obtain glass and glazing materials from one source for each product indicated. Coatings and finished assemblies, such as insulating units and laminated units, to be manufactured by the same fabricator in order to have a common source of warranty.

1.5 SUBMITTAL

- A. General: Comply with the provisions of Section 013000 – SUBMITTAL PROCEDURES.
- B. Samples:
 1. Submit samples of insulating and safety glass for review and approval.
 2. For new bronze tinted insulated glazing (GL-1), submit a range of bronze tinted glass samples available from glazing manufacturer to allow selection of a bronze tint that matches existing building glazing as closely as possible. Do not fabricate new bronze tinted insulating glass units until a bronze tint glass sample has been selected and approved by Architect.

1.6 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect glass and glazing materials before, during, and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.
- C. Warranties:
 1. Provide a written 10-year warranty from date of manufacture for insulating glass. Warranty shall cover deterioration due to normal conditions of use and not to handling, installing, and cleaning practices contrary to the glass manufacturer's published instructions.

PART 2 - PRODUCTS

2.1 GLASS AND GLAZING SHEETS

- A. All glass shall bear the label of its manufacturer and shall conform in all respects with the pertinent requirements of ASTM C1036 and ASTM C1048. Glass shall be annealed, heat-strengthened, or tempered as required by Code, or as required to meet thermal stress and wind loads.
- B. The following GL (Glazing) type numbers correspond with the GL numbers indicated on the Drawings.

GL-1: 1" Bronze Tint Tempered Insulating Glass: 1" insulating assembly consisting of ¼" (6mm) VITRO® tempered Solarban® 90 on tempered Solarbronze® Low-e #2 + ½"(12mm) air space + ¼" (6mm) VITRO® clear tempered as manufactured by Oldcastle Building Envelope™, CRL/US Aluminum, Dallas Texas (214) 634-7305, or approved equivalent. Provide in new exterior automatic sliding door frames at location shown and scheduled on the Drawings. Insulating glass assembly shall have the following performance characteristics:

1. UV Transmittance: 3%.
2. Visible Light Transmittance: 31%.
3. Total Solar Energy Transmittance: 11%.
4. Visible Light Reflectance (Outside): 7%.
5. Visible Light Reflectance (Inside): 18%.
6. U-Value – Winter- Nighttime: 0.29.
7. Shading Coefficient (SC): 0.20.
8. Solar Heat Gain Coefficient (SHGC): 0.18.
9. Light to Solar Gain (LSG): 1.73

GL-2: 1" Clear Insulating Glass: 1" insulating assembly consisting of ¼" (6mm) VITRO® clear tempered + ½"(12 mm) air space + ¼" (6mm) VITRO® clear tempered as manufactured by Oldcastle Building Envelope™, CRL/US Aluminum, Dallas Texas (214) 634-7305, or approved equivalent. Provide in new interior automatic sliding door frames and interior aluminum storefront frames at New Vestibule 101 locations as shown and scheduled on the Drawings. Insulating glass assembly shall have the following performance characteristics:

1. UV Transmittance: 50%.
2. Visible Light Transmittance: 79%.
3. Total Solar Energy Transmittance: 61%.
4. Visible Light Reflectance (Outside): 15%.
5. Visible Light Reflectance (Inside): 15%.
6. U-Value – Winter- Nighttime: 0.47.
7. Shading Coefficient (SC): 0.81.
8. Solar Heat Gain Coefficient (SHGC): 0.70.
9. Light to Solar Gain (LSG): 1.13

GL-3: ¼" Clear Tempered Glass: ¼" clear tempered safety glass. Provide at all interior aluminum and glass doors, sidelites, non-rated vision panels, and interior windows in locations as shown and scheduled on the Drawings.

GL-4: 5/16" Clear Fire Rated Glass: Provide at vision panels in fire-rated doors in locations as scheduled on the Drawings. Refer to Section 088117 – FIRE-RATED GLAZING.

GL-5: ¼" Clear Leaded Glass: Provide at vision windows requiring radiation shielding in locations as scheduled on the Drawings. Refer to Section 130900 – RADIATION PROTECTION.

2.2 TEMPERED GLASS

- A. Fully tempered glass shall comply with the following:
 - 1. ASTM C1048, Type 1, Class 1 (Clear), Class 2 (Tinted), Quality Q3, Kind FT.
 - 2. ANSI Z97.1.
 - 3. Permit minimum warpage practicable.

2.3 INSULATED GLASS UNITS

- A. Insulated glass units shall consist of glass lites separated by a dehydrated airspace that is hermetically dual sealed with a primary seal of polyisobutylene (PIB) or Thermoplastic Spacer (TPS) and a secondary seal of silicone or an organic sealant depending on the application.
- B. Insulated glass units shall be certified through the Insulating Glass Certification Council (IGCC) to meet requirements of ASTM E2190.

2.4 GLAZING COMPOUNDS AND SEALANTS

- A. General: Use glazing compounds and sealants approved for the application and, except as otherwise specified, conforming to the Glazing Materials portion of FGMA Glazing Manual.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions under which work of this section will be installed. Correct conditions detrimental to the proper execution of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Cut and install glass with the visible lines or waves running with the horizontal direction.
- B. Glass Installation:
 - 1. Items to be glazed shall be shop-glazed or field-glazed with glass of the quality and thickness as shown on the Drawings.
 - 2. Prepare surrounds and glass, unless otherwise directed, in conformance with the details and general conditions governing glazing in the FGMA Glazing Manual.
 - 3. Use beads or stops furnished with the items to be glazed to secure the glass in place.

3.3 CLEANING

A. Glass Cleaning:

1. Thoroughly clean all glass and remove all labels, paint spots, and other defacements.

END OF SECTION 088000

SECTION 088117 - FIRE-RATED GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire-rated glazing materials installed as vision lights in fire-rated doors as scheduled on the Drawings.
- B. Related Sections include the following:
 - 1. Section 081416 – ARCHITECTURAL WOOD DOORS for vision panels in interior fire-rated doors.

1.2 REFERENCE STANDARDS

- A. American National Standards Institute (ANSI):
 - 1. **ANSI Z97.1:** Standard for Safety Glazing Materials Used in Buildings.
- B. Consumer Product Safety Commission (CPSC):
 - 1. **CPSC 16 CFR 1201:** Safety Standard for Architectural Glazing Materials.
- C. Glass Association of North America (GANA):
 - 1. **GANA** – Glazing Manual.
- D. Flat Glass Marketing Association (FGMA):
 - 1. **FGMA** – Sealant Manual.
- E. National Fire Protection Association (NFPA):
 - 1. **NFPA 80:** Standard for Fire Doors and Other Opening Protectives.
 - 2. **NFPA 252** – Standard Methods of Fire Tests of Door Assemblies.
- F. Underwriters Laboratories, Inc. (UL):
 - 1. **UL 10B** – Standard for Fire Tests of Door Assemblies.
 - 2. **UL 10C** – Standard for Positive Pressure Fire Tests of Door Assemblies.
- G. International Building Code (IBC) 2021 Arkansas Fire Prevention Code with amendments.

1.3 DEFINITIONS

- A. **Manufacturer:** A firm that produces primary glass, fabricated glass or framing as defined in referenced glazing publications.

1.4 SUBMITTALS

- A. Comply with requirements of Section 013300 – SUBMITTAL PROCEDURES.
- B. Product Data: Submit manufacturer's technical data for each glazing material required, including installation and maintenance instructions.
- C. Certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements. Separate certification will not be required for glazing materials bearing manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to Authority Having Jurisdiction (AHJ).
- D. Product Test Listings: From UL indicating fire-rated glass complies with requirements, based on comprehensive testing of current product.
- E. Samples: Submit, for verification purposes, approx. 8-inch by 10-inch sample for each type of glass indicated.

1.5 QUALITY ASSURANCE

- A. Glazing Standards: GANA Glazing Manual and FGMA Sealant Manual.
- B. Fire Protective Rated Glass: Each lite shall bear permanent, non-removable label of UL certifying it for use in tested and rated fire protective assemblies.
- C. Fire Protective Glazing Products for Door Assemblies: Products identical to those tested per UL 10B, classified and labeled by UL.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials under provisions of Section 016000 – PRODUCT REQUIREMENTS.
- B. Deliver materials to specified destination in manufacturer or distributor's packaging, undamaged, complete with installation instructions.
- C. Store off ground, under cover, protected from weather and construction activities.

1.7 WARRANTY

- A. Provide manufacturer's limited warranty under provision of Section 016000 – PRODUCT REQUIREMENTS

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: FireLite Plus® as manufactured by Nippon Electric Glass Company, Ltd., and distributed by Technical Glass Products, 8107 Bracken Place SE, Snoqualmie, WA 98065 (800-426-0279) fax (800-451-9857) e-mail sales@fireglass.com, web site <http://www.fireglass.com>, or approved equivalent.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-rated glass ceramic clear and wireless glazing material listed for use in impact safety-rated locations such as vision lights in fire-rated doors with fire rating requirements ranging from 20 to 90 minutes with required hose stream test.
- B. Passes positive pressure test standards UL 10C.

2.3 MATERIALS-GLASS

- A. Properties:
 - 1. Thickness: 5/16 inch [8 mm] overall.
 - 2. Weight: 4 lbs./sq. ft.
 - 3. Approximate Visible Transmission: 85 percent.
 - 4. Approximate Visible Reflection: 9 percent.
 - 5. Fire-rating: 20 minutes to 3 hours for doors; 20 minutes to 90 minutes for other applications.
 - 6. Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201 (Cat. I and II).
 - 7. STC Rating: Approximately 38 dB.
 - 8. Surface Finish:
 - a. Standard Grade: polished for a surface quality comparable to alternative fire-rated ceramics marketed as having a premium finish.
 - 9. Positive Pressure Test: UL 10C; passes.
- B. Maximum sheet sizes based on surface finish:
 - 1. Standard: 48 inches by 96 inches.
- C. Labeling: Permanently label each piece of FireLite Plus® with the FireLite Plus® logo, UL logo and fire rating in sizes up to 3,325 sq. in., and with the FireLite Plus® label only for sizes that exceed the listing (as approved by the local Authority Having Jurisdiction (AHJ)).
- D. Fire Rating: Fire rating classified and labeled by UL for fire rating scheduled at opening locations on Drawings, when tested in accordance with NPFA 252, UL 10B and UL 10C.
- E. Substitutions: Refer to Section 016000 – PRODUCT REQUIREMENTS and Section 012500 – SUBSTITUTION PROCEDURES..

2.4 GLAZING COMPOUND FOR FIRE-RATED GLAZING MATERIALS

- A. Glazing Compound: DAP 33 putty.
- B. Silicone Sealant: One-part neutral curing silicone, medium modulus sealant, Type S; Grade NS; Class 25 with additional movement capability of 50 percent in both extension and compression (total 100 percent); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable. Available Products:
 - 1. Dow Corning 795 - Dow Corning Corp.
 - 2. Silglaze-II 2800 - General Electric Co.
 - 3. Spectrem 2 - Tremco Inc.
- C. Setting Blocks: Neoprene, EPDM, or silicone; tested for compatibility with glazing compound; of 70 to 90 Shore A hardness.
- D. Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

2.5 FABRICATION

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine glass framing, with glazier present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
 - 2. Minimum required face or edge clearances.
 - 3. Observable edge damage or face imperfections.
- B. Do not proceed with glazing until unsatisfactory conditions have been corrected.
- C. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.2 INSTALLATION (GLAZING)

- A. Comply with referenced FGMA standards and instructions of manufacturers of glass, glazing sealants, and glazing compounds.
- B. Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.

- C. Set units of glass in each series with uniformity of pattern, draw, bow, and similar characteristics.
- D. Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.
- E. Place setting blocks located at quarter points of glass with edge block no more than 6 inches from corners.
- F. Glaze vertically into labeled fire-rated metal frames or partition walls with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.
- G. Place glazing tape on free perimeter of glazing in same manner described above.
- H. Install removable stop and secure without displacement of tape.
- I. Use specified glazing compound, without adulteration; bed glazing material in glazing compound; entirely fill all recess and spaces. Provide visible glazing compound with smooth and straight edges.
- J. Install in vision panels in fire-rated doors to requirements of NFPA 80.
- K. Install so that appropriate UL and FireLite Plus® markings remain permanently visible.

3.3 PROTECTION AND CLEANING

- A. Protect glass from contact with contaminating substances resulting from construction operations. Remove any such substances by method approved by glass manufacturer.
- B. Wash glass on both faces not more than four days prior to date scheduled for inspections intended to establish date of Substantial Completion. Wash glass by method recommended by glass manufacturer.

3.4 GLAZING SCHEDULE

Rating	Assembly	Max. Exposed Area (Sq. In.)	Max. Width Of Exposed Glazing (In.)	O R	Max. Height Of Exposed Glazing (In.)
20 to 60 min.	Doors (non-temp rise)	3,204"	36"		89"
	Doors (temp rise)	100"	12"		33"
90 min.	Doors (non-temp rise)	2,034"	36"		56 ½"
	Doors (temp rise)	100"	12"		33"

END OF SECTION 088117

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SECTION 092216 - NON-STRUCTURAL METAL FRAMING

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. Non-load-bearing steel framing systems for interior partitions.

- B. Related Sections:

- 1. Section 017300 – EXECUTION: Wood blocking for interior walls.
 - 2. Section 061000 – ROUGH CARPENTRY: Wood blocking requirements.
 - 3. Section 081250 – INTERIOR ALUMINUM DOOR FRAMES.
 - 4. Section 092226 – METAL SUSPENSION SYSTEMS: Prefabricated ceiling systems for gypsum board ceilings.
 - 5. Section 092900 – GYPSUM BOARD: Gypsum board for interior partitions.

- C. Reference Standards:

- 1. American Iron and Steel Institute (AISI):

- a. **AISI S220** – North American Standard for Cold-Formed Steel Framing – Nonstructural Members.

- 2. American Society for Testing and Materials (ASTM):

- a. **ASTM A641** – Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - b. **ASTM C645** – Standard Specification for Nonstructural Steel Framing Members.
 - c. **ASTM A653** – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvaneled) by the Hot Dipped Process.
 - d. **ASTM C754** – Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - e. **ASTM C840** – Standard Specification for Application and Finishing of Gypsum Board.
 - f. **ASTM E90** – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - g. **ASTM E119** – Standard Test Method for Fire Tests of Building Construction and Materials.
 - h. **ASTM E413** – Classification for Rating Sound Insulation.
 - i. **ASTM G40** – Standard Terminology Relating to Wear and Erosion.

3. International Accreditation Service (IAS).
4. International Building Code (IBC).
5. International Code Council (ICC):
 - a. **ICC-ES-AC86** – Cold-formed Steel Framing Members – Interior Nonload-bearing Wall Assemblies.
 - b. **ICC-ES AC98** – Acceptance Criteria for Quality Control Agency Accreditation.
6. Steel Framing Industry Association (SFIA) – Code Compliance Certification Program.
7. Steel Stud Manufacturers’ Association (SSMA).
8. Underwriters Laboratories (UL):
 - a. **UL Design No. U419** – Interior Partitions – Steel Studs (Non-Load Bearing) – I Hour Fire Rating.
 - b. **UL Design No. V438** – Non-Bearing Wall Ratings – 1, 2, 3, or 4 Hour.
 - c. **UL Design No. V450** – Fire Rated Wall Assemblies.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of code-compliance certification for studs and tracks.
- B. Evaluation Reports: Submit evaluation reports certified under an independent third-party inspection program administered by an agency accredited by IAS to ICC-ES AC98 accreditation criteria for inspection agencies.
- C. Manufacturer's Certification: Submit manufacturer's certification of product compliance with codes and standards along with product literature and data sheets for specified products.

1.5 QUALITY ASSURANCE

- A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified in accordance with the product-certification program of the Steel Framing Industry Association (SFIA) or a similar organization that provides a verifiable code-compliance program.
- B. Contractor shall provide effective, full-time quality control over all fabrication and erection complying with pertinent codes and regulations of government agencies having jurisdiction. Conduct preinstallation meeting to verify Project requirements, substrate conditions, and manufacturer's written installation instructions.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Notify manufacturer of damaged materials received prior to installation.

- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, in accordance with ASTM E119, and displaying a classification label from an independent testing agency acceptable to Authorities Having Jurisdiction (AHJ).
 - 1. Construct fire-resistance-rated partitions in compliance with tested assembly requirements indicated on Drawings.
 - 2. Rated assemblies to be substantiated from applicable testing using proposed products, by Contractor.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, in accordance with ASTM E90 and classified in accordance with ASTM E413 by an independent testing agency.
- C. Horizontal Deflection: For composite wall assemblies, limited to 1/240 of the wall height based on horizontal loading of 5 lbf/sq. ft. (239 Pa).
- D. Design framing systems in accordance with AISI S220, "North American Standard Cold-Formed Steel Framing - Nonstructural Members," unless otherwise indicated.
- E. Design Loads: As indicated on Structural Drawings or 5 lbf/sq. ft. (239 Pa) minimum as required by the IBC.
- F. Design framing systems to accommodate deflection of primary building structure and construction tolerances and to withstand design loads with a maximum deflection of $\frac{3}{4}$ inches (19.05 mm) to 1 inch (25.4 mm).

2.2 FRAMING SYSTEMS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Framing Members, General: Comply with ASTM C645, AISI S220 and ASTM C645, Section 10 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C645, AISI S220 and ASTM C645, Section 10 requirements for metal unless otherwise indicated.

2. Protective Coating: Comply with ASTM C645, AISI S220; ASTM A653/A653M, ASTM G40 (Z120); or coating with equivalent corrosion resistance. Galvannealed products are unacceptable.
 - a. Coating shall demonstrate equivalent corrosion resistance with an evaluation report acceptable to Authorities Having Jurisdiction (AHJ).
 - b. Basis-of-Design Coating: Subject to compliance with requirements, provide ClarkDietrich; DiamondPlus Coating on ProSTUD and ProTRAK 20.

C. Non-Structural Studs and Track: ASTM C645, AISI S220 and ASTM C645, Section 10.

1. Non-Structural Studs: Cold-formed steel C-studs meeting conditions indicated below:
 - a. Studs shall comply with non-composite fully braced only if gypsum wall board exists on both sides of studs full height or braced at 48" on center with appropriate wall bridging in place where gypsum board is missing on one side or both sides.
 - b. Studs shall not exceed the following spans unless design data with load tables are submitted for non-composite design:

MEMBER	Max Span
Standard Studs	
SSMA 362S125-33	16' – 0"
SSMA 600S125-33	23' – 9"
EQ Studs	
ProStud 20 362PDS125-18	13' – 2"
ProStud 20 600PDS125-18	18' – 9"

- c. Subject to compliance with requirements specified herein, provide standard structural stud framing complying with Steel Stud Manufacturers Association (SSMA), ClarkDietrich ProSTUD 20 (20 EQ) 70 ksi (483 MPa) product with Smart Edge Technology, or equivalent product by one of the following current members of the SFIA:
 - 1) CEMCO; California Expanded Metal Products Co., City of Industry, CA.
 - 2) Telling Industries, Willoughby, OH.
 - 3) Or approved manufacturer.
- d. Flange Size: 1-1/4 inches (1.25 in.) (32mm).
- e. Web Depth: 3-5/8 inches (3.625 in.) (92mm) and 6 inches (6.0 in.) (152 mm).
- f. Standard Stud Minimum Thickness: 0.0329 inch (33 mils) (0.8356 mm).
- g. Standard Stud Minimum Design Thickness: 0.0346 inch (35 mils) (0.8788 mm).
- h. Standard Stud Gauge Reference: 20 ga.
- i. EQ Stud Minimum Base-Steel Thickness: 0.0181 inch (18 mils) (0.4597 mm).

- j. EQ Stud Minimum Design Thickness: 0.0190 inch (19 mils) (0.4826 mm).
 - k. EQ Stud Gauge Reference: 20 EQ ga.
2. Non-Structural Track: Cold-formed steel drywall track for conditions indicated below:
- a. Subject to compliance with requirements specified herein, provide standard steel drywall track complying with Steel Stud Manufacturers Association (SSMA), ClarkDietrich ProTRAK with Smart Edge technology, or equivalent product by one of the following current members of the SFIA:
 - 1) CEMCO; California Expanded Metal Products Co., City of Industry, CA.
 - 2) Telling Industries, Willoughby, OH.
 - 3) Or approved manufacturer.
 - b. Flange Size: 1-1/4 inches (1.25 in.) (32mm).
 - c. Web Depth: Track web to match stud web size.
 - d. Minimum Base-Steel Thickness: Track thickness to match wall stud thickness or as per design.
 - e. Track Gauge Reference: To match wall stud gauge.
3. Equivalent Gauge Thickness (EQ) Steel Studs and Runners: Members that can show certified third-party testing with gypsum board in accordance with ICC-ES AC86 need not comply with minimum thickness limitation or minimum section properties set forth in ASTM C645. Submission of an evaluation report is acceptable to show compliance with this requirement.
4. Special Studs and Track: Furnish and install 8-inch studs and track for framing chase wall partitions at back-to-back toilets and other locations as shown on the Drawings. Stud and track properties as follows:
- a. Clark Dietrich Standard Studs and Track, or approved equivalent, complying with Steel Stud Manufacturers Association (SSMA):
 - 1) Stud Designation: SSMA 800S137-33.
 - a) Flange Size: 1-3/8 inches (1.375 in.) (35 mm).
 - b) Web Depth: 8 inches (8.00 in.) (203 mm).
 - c) Minimum Thickness: 0.0329 inch (33 mils) (0.8356 mm).
 - d) Minimum Design Thickness: 0.0346 inch (35 mils) (0.8788 mm).
 - e) Gauge Reference: 20 gauge.

- 2) Track Designation: SSMA 800T137-33.
 - a) Flange Size: 1-3/8 inches (1.375 in.) (35 mm).
 - b) Web Depth: Match stud web depth.
 - c) Minimum Thickness: Match stud minimum thickness.
 - d) Gauge Reference: 20 gauge.

b. Optional Clark Dietrich ProStud 20 EQ Studs and ProTrak 20 Track, or approved equivalent:

- 1) Stud Designation: ProStud 20 800PDS.
 - a) Strength: 70 ksi.
 - b) Flange Size: 1-3/8 inches (1.375 in.) (35 mm).
 - c) Web Depth: 8 inches (8.00 in.) (203 mm).
 - d) Minimum Thickness: 0.0181 in. (18 mils) (0.4597 mm).
 - e) Minimum Design Thickness: 0.0190 in. (19 mils) (0.4826 mm).
 - f) Gauge Reference: 20EQ.
- 2) Track Designation: ProTrak 20 800PDT.
 - a) Strength: 50 ksi.
 - b) Flange Size: 1-3/8 inches (1.375 in.) (35 mm).
 - c) Web Depth: Match stud web depth.
 - d) Minimum Thickness: Match stud minimum thickness.
 - e) Gauge Reference: 20EQ.

D. Slip-Type Head Joints: Where indicated or required, provide one of the following:

1. Clip System: Clips designed for use in head-of-wall deflection conditions that provide a positive attachment of studs to tracks while allowing 2-1/2-inch- (64-mm-) minimum vertical movement.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Fast Top Clip FTC3, FTC5, or equivalent product by one of the following current member of the SFIA:
 - 1) CEMCO; California Expanded Metal Products Co., City of Industry, CA.
 - 2) The Steel Network, Inc., Durham, NC.
 - 3) Approved Manufacturer.
2. Single Long-Leg Track System: Top track with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top track and cold-formed channel with clip angles located within 12 inches (305 mm) of the top of studs to provide lateral bracing.

- a. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Cold-Formed Channel and EasyClip U-Series Angle U543, U545, U547, or equivalent product by a manufacturer that is a current member of the SFIA:
 - 3. Double-Track System: Top outer tracks, inside track with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.
 - 4. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich MaxTrak SLT Slotted Deflection Track or equivalent product by one of the following current members of the SFIA:
 - 1) CEMCO; California Expanded Metal Products Co., City of Industry, CA.
 - 2) Telling Industries, Willoughby, OH.
 - 3) Approved Manufacturer.
- E. Backing Plate: Proprietary fire-retardant-treated wood blocking and bracing in width indicated.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Danback Fire-Retardant Treated Wood Backing Plate D16F, D24F, or equivalent product by a manufacturer that is a current member of the SFIA:
- F. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Backing Plate or equivalent product by a manufacturer that is a current member of SFIA:
 - 2. Minimum Base-Steel Thickness: As indicated on Drawings, 0.0179 inch (0.45 mm) or 0.0296 inch (0.75 mm).
- G. Channel Bridging and Bracing: Pre-notched steel, 7/8 by 7/8 by 50 inches (22.2 by 22.2 by 1270 mm), 0.0329-inch- (0.84-mm-) minimum base-steel thickness.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Spazzer 9200 Bridging and Spacing Bar or equivalent product by a manufacturer that is a current member of the SFIA:
- H. U-Channel Bridging: Steel, 0.0538-inch- (1.37-mm-) minimum base-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.

1. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Cold-Formed U-Channel and Channel Clip (CC33), FastBridge (FB33), Bridging Clip or equivalent product by a manufacturer that is a current member of the SFIA.
 2. U-Channel Depth: 3/4 inch (19 mm), 1-1/2 inches (38 mm), or As indicated on Drawings.
- I. Rigid Furring Channels: Hat-shaped channels for furring out walls.
1. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Furring Channel or equivalent product by a manufacturer that is a current member of the SFIA.
 2. Minimum Base-Steel Thickness: 0.0179 inch (0.45 mm) or 0.0296 inch (0.75 mm).
 3. Depth: 7/8 inch (22.2 mm), 1-1/2 inches (38 mm).
- J. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.
1. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; RC Deluxe (RCSD) Resilient Channel or equivalent product by a manufacturer that is a current member of the SFIA.
 2. Configuration: Asymmetrical.
- K. Carrying Channels: 0.053-inch (1.37-mm) base-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Depth: 3/4 inch (19 mm).
 2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum base-steel thickness of 0.0296 inch (0.75 mm).
 3. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.57-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.
- L. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 3/4 inch (19 mm), minimum base-steel thickness of 0.0179 inch (0.45 mm), and depth required to fit insulation thickness indicated.
1. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Z-Furring Channel or equivalent product by a manufacturer that is a current member of the SFIA.
- M. Radius Framing: Steel sheet runner for non-load-bearing curves, bends, variable radii, and arches using expandable ribbon technology.
1. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Interior Contour Track or equivalent product by a manufacturer that is a current member of the SFIA.
 2. Minimum Base-Steel Thickness: 0.0296 inch (0.75 mm).
 3. Depth: 2-1/2 inches (63.5 mm), 3-5/8 inches (92.1 mm), 6 inches (152.4 mm).

- N. Headers and Jambs: Manufacturer's proprietary shape used to form header beams and jambs, columns or posts, of web depths indicated, unpunched, with stiffened flanges and as follows:
1. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Heavy-Duty Studs (HDS) and Type HDSC Header Bracket or equivalent product by a manufacturer who is a current member of the SFIA.
 2. Minimum Base-Steel Thickness: 0.0329 inch (0.84 mm), 0.0428 inch (1.09 mm), 0.0538 inch (1.37 mm), 0.0677 inch (1.72 mm), 0.0966 inch (2.45 mm).
 3. Web Size: 3-5/8 inches (92.1 mm) or 6 inches (152 mm).
 4. Flange Size: 3 inches (76.2 mm).
- O. Special Prefabricated Jamb and Header Framing for Interior Wall Openings:
1. Contractor has option to furnish and install Red Header PRO™ Rough Opening System, a one-piece header and jamb framing system engineered to replace conventional multi-component boxed headers and built-up jamb framing at door and window rough openings, as manufactured by ClarkDietrich, www.clarkdietrich.com.
 2. Size and thickness of jamb studs shall be as required to match interior wall stud framing. Header studs shall be sized as required for span of rough openings.
 3. Provide headers, jamb studs, brackets, clips, and all other components as required for a complete installation.
 4. Submit shop drawings showing locations of framed openings and typical installation details.
 5. Submit complete product data describing all components being used for review and approval.

2.3 SUSPENSION SYSTEMS

- A. Refer to Section 092226 – METAL SUSPENSION SYSTEMS.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 - 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.
- B. Coordination with Sprayed Fire-Resistive Materials (if specified for Work and indicated on Drawings):
 - 1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling tracks to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches (610 mm) o.c.
 - 2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that are required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C754.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.
- E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components in accordance with spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 - 1. Single-Layer Application: 16 inches (406 mm) o.c. unless otherwise indicated.
 - 2. Multilayer Application: 16 inches (406 mm) o.c. unless otherwise indicated.
 - 3. Tile Backing Panels: 16 inches (406 mm) o.c. unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 - 4. Fire-Resistance-Rated Partitions (if indicated on Drawings): Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Install fire-resistant partitions using manufacturer's standard gauge studs or proprietary equivalent-gauge studs in compliance with requirements of UL U419, UL V450, UL V438.
 - 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
 - 6. Curved Partitions (if indicated on Drawings):
 - a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
 - b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches (152.4 mm) o.c.
- E. Direct Furring:
 - 1. Screw to wood framing.
 - 2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
- F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

END OF SECTION 092216

SECTION 092226 - METAL SUSPENSION SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Suspension System Framing and Furring for Gypsum Board Ceiling Assemblies.
 - 2. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.
- B. Related Sections:
 - 1. Section 092900 - GYPSUM BOARD.
 - 2. Section 095113 - ACOUSTICAL TILE CEILINGS.
 - 3. Division 23 Sections – Mechanical (HVAC) Work.
 - 4. Division 26 Sections - Electrical Work.

1.3 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. **ASTM A641** – Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - 2. **ASTM A653** - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
 - 3. **ASTM C635** - Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
 - 4. **ASTM D610** - Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces
 - 5. **ASTM E119** - Standard Test Method for Fire Tests of Building Construction and Material (if applicable).

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical literature.
- B. Samples: 8 inch long samples of suspension system components, including main runner, cross tees and angle molding.
- C. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility: To ensure proper interface, all drywall furring components shall be produced or supplied by a single manufacturer.
- B. All accessory components from other manufacturers shall conform to referenced ASTM standards.
- C. Fire Resistance Ratings: As indicated by reference to design designations in Underwriters Laboratory (UL) Fire Resistance Directory, for types of assemblies in which drywall ceilings function as a fire protective membrane and tested per ASTM E 119. Installation in accordance with the UL Design being referenced.
- D. Coordination of Work:
 - 1. Coordinate drywall furring work with installers of related work including, but not limited to acoustical ceilings, building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.
 - 2. All work above the ceiling line shall be completed prior to installing the drywall sheet goods. There shall be no materials resting against or wrapped around the suspension system, hanger wires or ties.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

1.7 WARRANTY

- A. Suspensions System: Submit a written limited warranty executed by the manufacturer, agreeing to repair or replace grid components that are supplied with a hot-dipped galvanized coating or aluminum base material. Failures include, but are not limited to:
 - 1. The occurrence of 50% red rust as defined by ASTM D 610 test procedures as a result of defects in materials or factory workmanship.
- B. Warranty Period:
 - 1. Grid: Ten years from date of installation.
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Suspension System: Armstrong World Industries, Inc., or approved equivalent.

2.2 SUSPENSION SYSTEMS

A. Components:

1. Main Beam: Shall be double-web construction (minimum 0.0179 inch prior to protective coating), hot dipped galvanized (per ASTM A653).
 - a. HD8901: 1-1/2 inch web height, prefinished 15/16 inch flange with minimum G40 hot dipped galvanization
 - b. HD8906: 1-11/16 inch web height, 1-1/2 inch flange, available with G40 or G90 hot dipped galvanization.
 - c. HD8906F08: 1-11/16 inch web height with pre-cut facets (8 inches on center) for radius installations, 1-1/2 inch flange.
 - d. HD8906F16: 1-11/16 inch web height with pre-cut facets (8 inches from ends, then 16 inches on center) for radius installations, 1-1/2 inch flange.
2. Primary Cross Tees: Shall be double-web steel construction (minimum 0.0179 inch prior to protective coating), hot dipped galvanized (minimum G40 or G90 per ASTM A653), web height 1-1/2 inch with rectangular bulb and pre-finished 1-1/2 inch knurled flange (XL8945P, XL8965, XL8947P).
3. Secondary Framing Cross Tees : Shall be double web steel construction (minimum 0.0179 inch prior to protective coating), hot dipped galvanized (minimum G40, web height 1-1/2 inch rectangular bulb and 15/16 inch flange (XL8341).
4. QuikStix Soffits DGS: Tees designed for creating soffits; 1-1/2 inch web height. 1-1/2 inch flange, flattened bulb, bending crimp, knockouts and alignment holes to facilitate creating 15, 30, 45, 60 and 90 degree angles; available with G40 or G90 hot dipped galvanization.
 - a. QS610: 10 foot tee with knockouts 6 inches on center
 - b. QS810: 10 foot tee with knockouts 8 inches on center
5. Wall Molding:
 - a. LAM-12, 12 foot Locking Angle Molding, 1-1/4 inch x 1-1/4 inch with pre-engineered locking tabs punched 8 inches on center, knurled surface, screw stop hem, pre-punched holes in top flange.
 - b. KAM -12, 12 foot Knurled Angle molding, 1-1/4 inch x 1-1/4 inch, knurled surface, screw stop hem, pre-punched holes in top flange.
 - c. KAM-10, 10 foot Knurled Angle molding, 1-1/4 inch x 1-1/4 inch, knurled surface, screw stop hem, pre-punched holes in top flange.
 - d. 7838: Hot dipped galvanized (minimum G40), unhemmed channel molding, 3/4 inch x 1-9/16 inch x 1-1/4 inch flange.

6. Clips:
 - a. MBAC - Main Beam Adapter Clip.
 - b. DWACS, DW50, DW58 - Drywall Attachment Clip for transitions to acoustical ceilings.
 - c. Drywall Angle Clips - Available in 30 degree, 45 degree, 60 degree and 90 degree angles.
 - d. XTAC - Cross Tee Adapter Clip.
 - e. Radius Clip (RC2)- Required to cover all pre-cut facets, including those not being clipped.
7. Screws for wallboard application shall be bugle head screws in accordance with thickness of material used.
8. Wire for Hangers and Ties: ASTM A641, Class 1 zinc coating, soft annealed, with a yield stress load of at least three (3) times design load, but not less than 12 gauge.

B. Structural Classification:

1. Main Beam shall be heavy duty per ASTM C 635.
2. Classification can require wires to be closer together for additional loading when used to support double layer gypsum, verticals, slopes, domes, half barrels, circles, soffits, canopies, and step conditions which call for loading or unusual designs and shapes in drywall construction. Using cross tees in the construction of circles, barrels, etc. is common in order to hold the radius.
3. Deflection of fastening suspension system supporting light fixtures, ceiling grilles, access doors, verticals and horizontal loads shall have a maximum deflection of 1/360 of the span.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

- A. Install suspension system and panels in accordance with the manufacturer's instructions, in compliance with ASTM installation standard, and with applicable codes as required by the Authorities Having Jurisdiction (AHJ).
- B. The Armstrong Drywall Grid System can be installed in interior or exterior applications.
- C. To secure to metal clips, concrete inserts, steel bar joist or steel deck, use power actuated fastener, or insert. Coordinate placement for hanger wire spaced as required for expected ceiling loads and layout.
- D. Install hanger wire as required with necessary on center spacing to support expected ceiling load requirements, following local practices, codes and regulations. Provide additional wires at light fixtures, grilles, and access doors where necessary. A pigtail knot shall be used with three tight wraps at top and bottom fastening locations.
- E. Add additional wire as needed when using compatible clips and accessories.

- F. Control Joints: Roll formed zinc alloy, aluminum, or plastic as required for expansion and contraction as shown on Drawings.
- G. Expansion Joints: Roll formed zinc alloy, aluminum, or plastic as required for expansion and contraction as shown on Drawings.
- H. Main beams shall be suspended from the overhead construction with hanger wire, spaced as required for expected ceiling loads, along the length of the main beams.
- I. Install cross tees at on center spacing as specified by the drywall manufacturer. Typical drywall cross tee spacing:
 - 1. 16 inches on center with 1/2 inch gypsum board
 - 2. 24 inches on center with 5/8 inch gypsum board
- J. Other items such as wood, sheet metal, or plastic panels shall be screwed to comply with deflection limit equivalent to that of the ceiling installation.
- K. Use channel molding or angle molding to interface with Drywall Grid System to provide perimeter attachment or to obtain drop soffits, verticals, slopes, or other ceiling features.
- L. To suspend a second ceiling beneath a new or existing drywall ceiling, without breaching the integrity of the upper ceiling, use the Drywall Clip. To form a transition from a drywall ceiling to an acoustical ceiling, use the Drywall Transition Clips spaced as required for expected loads.
- M. For light fixtures use secondary framing cross tees as required to frame opening.
- N. Single cross tees in a route hole to be secured by 7/16 inch framing screw or alternative methods.

3.2 INSTALLATION - EXTERIOR APPLICATIONS (IF INDICATED ON DRAWINGS)

- A. Use G90 components for exterior applications.
- B. Use vertical bracing as required by Codes and standards in accordance with local Authorities Having Jurisdiction (AHJ) (non-fire rated installations).
- C. Install main beams as required according to Wind Uplift Design or local Codes and standards.
- D. Install cross tees as required according to Wind Uplift Design or local Codes and standards, with additional tees when point loading (vertical), and with additional hanger at midspan of cross tee, as needed.

3.3 INSTALLATION - INTERIOR APPLICATIONS

- A. Install main beams and cross tees at the on center spacing required for ceiling loading, and location of in-ceiling services.
- B. Install additional bracing as required by Code.

3.4 INSTALLATION - RADIUS APPLICATIONS (IF INDICATED ON DRAWINGS)

- A. Determine the bow or camber (Convex or Concave) in a main runner.
- B. Establish a jig or pattern on a flat surface; mark locations to cut main beam; and use four pan head screws to fasten a Radius Clip (RC2) flat to the web between the bulb and the flange, per the manufacturer's instructions.
- C. Install main beams with on center spacing and wire spacing, as needed, to support expected ceiling load.
- D. Provide additional bracing that may be required by Code.
- E. Install cross tees at on center spacing as specified by the manufacturer.

END OF SECTION 092226

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 TESTS

A. Fire-Test-Response Characteristics: Where fire-rated gypsum board assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by Underwriters Laboratory (UL). See Drawings for U.L. Gypsum Board assemblies required.

B. REFERENCE STANDARDS

1. American Society for Testing And Materials (ASTM):

- a. **ASTM A641** – Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire..
- b. **ASTM C475** – Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- c. **ASTM C630** – Standard Specification for Water-Resistant Gypsum Backing Board.
- d. **ASTM C645** – Standard Specification for Nonstructural Steel Framing Members.
- e. **ASTM C754** – Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- f. **ASTM C840** – Standard Specification for Application and Finishing of Gypsum Board.
- g. **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) Thickness.
- h. **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.
- i. **ASTM C1047** – Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- j. **ASTM C1396** – Standard Specification for Gypsum Board.
- k. **ASTM E119** – Standard Test Methods for Fire Tests of Building Construction and Materials.

2. Gypsum Association (GA):

- a. **GA-214** – Recommended Levels of Gypsum Board Finish.
- b. **GA-216** – Application and Finishing of Gypsum Panel Products.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturers: Basis of Design: Subject to compliance with requirements, provide gypsum board and related products by one of the following:

1. Georgia-Pacific Gypsum, LLC, Georgia-Pacific Building Products, Atlanta, GA.
2. CertainTeed Gypsum, Inc., Malvern, PA.
3. Gold Bond Building Products Div., National Gypsum Co., Charlotte, SC.
4. United States Gypsum Corporation, Chicago, IL.
5. Or Approved Manufacturer.

2.2 PRODUCTS, GENERAL

A. Steel Framing for Interior Walls and Partitions: Comply with ASTM C754 and the following general requirements:

1. Interior metal studs shall be 3-5/8" and 6" wide electro-galvanized channels spaced at 16" on center with openings for routing conduit and piping unless otherwise noted on the Drawings.
2. Provide metal stud runners (tracks) at top and bottom of each wall and partition, anchored securely to floor and structure above. Metal stud runners (tracks) shall be the same thickness as the metal stud framing in the walls or partitions in which they occur, unless indicated otherwise.
3. Refer to paragraph 2.2.B below for optional special framing system at interior door and window openings.
4. Refer to Section 092216 – NON-STRUCTURAL METAL FRAMING for detailed metal stud requirements for interior wall and partition framing.
5. Furnish and install additional metal stud framing as required to brace partitions, door frames, furr-downs, and other special framing conditions shown on the Drawings.
6. Grid Suspension System for Interior Gypsum Board Ceilings: Prefabricated system complying with ASTM C645 and composed of interlocking main beams and cross furring members forming a modular supporting network. Refer to Section 092226 – METAL SUSPENSION SYSTEMS for additional requirements.
7. Wire for Hangers and Ties: Comply with ASTM A641, soft temper, Class 1 zinc coating.
8. Protective Coating for All Framing Members: Manufacturer's standard corrosion-resistant coating.
9. Steel Rigid Furring Channels: Comply with ASTM C645, minimum 0.0179 inch, 18 mils, 0.455 mm (25 gauge) base metal thickness, hat-shaped, 7/8" deep x 2-3/4" wide. Where shown as resilient, provide manufacturer's special type designed to reduce sound transmission.
10. Fasteners for Metal Framing: Type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates and complying with the recommendations of gypsum board manufacturers for applications indicated.

B. Special Jamb and Header Framing for Interior Wall Openings.

1. Contractor has option to furnish and install Red Header PRO[™] Header and Jamb Studs, a one piece header and jamb framing system engineered to replace conventional multi-component boxed headers and built-up jamb framing at door and window rough openings, as manufactured by ClarkDietrich, www.clarkdietrich.com.

2. Size and thickness of jamb studs shall be as required to match interior wall stud framing. Header studs shall be sized as required for span of rough openings.
 3. Provide headers, jamb studs, brackets, clips, and all other components as required for a complete installation.
 4. Submit shop drawings showing locations of framed openings and typical installation details.
 5. Submit complete product data describing all components being used for review and approval.
- C. Gypsum Board: Provide gypsum board of types indicated, in maximum lengths available, to minimize end joints:
1. Gypsum Wallboard: ASTM C 1396, thickness as indicated.
 - a. Type: Type X at all areas.
 - b. Type: Sag-resistant type for ceiling surfaces.
 - c. Edges: Tapered.
 - d. Fire Rated Gypsum Board: Subject to requirements specified herein, provide one of the following gypsum core panels with a solid set, fire-resistive core for use in fire-resistive Type C (Enhanced Type X) designs complying with ASTM C1396, Type X for all gypsum board indicated on the Drawings:
 - 1) 5/8" ToughRock® Fireguard X® Gypsum Board, Georgia Pacific Gypsum LLC.
 - 2) 5/8" Gold Bond® Fire-Shield® Gypsum Board, Gold Bond Building Products Division, National Gypsum Company.
 - 3) 5/8" Sheetrock® Brand Firecode® C Gypsum Panels, United States Gypsum Corporation.
 - 4) 5/8" CertainTeed Type X, CertainTeed Gypsum, Inc.
 - 5) Or approved equivalent.
 2. Water-Resistant Gypsum Backing Board: ASTM C 630, thickness as indicated on the Drawings.
 - a. Type: Type X at all areas.
- D. Accessories for Interior Installation: Corner beads, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:
1. Material: Formed metal, plastic, or metal combined with paper, with metal complying with the following requirement:
 - a. Sheet steel zinc-coated by hot-dip process.
 2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
 - a. Cornerbead on all outside corners, unless otherwise indicated.
 - b. LC-bead with both face and back flanges; face flange formed to receive joint compound: USG Sheetrock®, Brand Dur-A Bead®, Corner Bead, or approved equivalent. Use LC-beads for edge trim unless otherwise

indicated.

- c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where required by industry standard.
- d. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where required by industry standard.
- e. One-piece control joint formed with V-shaped slot, with removable strip covering slot opening, USG Sheetrock® Zinc Control Joint No. 093, or approved equivalent. Control joints shall extend full height of wall, from floor slab to deck above. See paragraph 3.1.B.8 below.

F. Gypsum Board Joint Treatment Materials: ASTM C 475 and ASTM C 840, and as follows:

- 1. Joint Tape: Paper reinforcing tape, unless otherwise indicated.
 - a. Use open-weave glass-fiber tape where recommended by gypsum board manufacturer with setting-type joint compound.
- 2. Setting-Type Joint Compound: Factory-packaged, job-mixed chemical-hardening powder products formulated for uses indicated.
 - a. For topping compound, use sandable formulation.
- 3. Drying-Type Joint Compounds: Factory-packaged, vinyl-based products complying with the following requirements:
 - a. Ready-Mixed Formulation: Factory premixed.
 - b. Job-Mixed Formulation: Powder product, mixed with water at Project Site.
 - c. Taping compound formulated for embedding tape and first coat over fasteners and flanges of corner beads and edge trim.
 - d. Topping compound formulated for fill (second) and finish (third) coats.
 - e. All-purpose compound formulated as both taping and topping compound.

G. Special Drywall Treatment

- 1. Furnish and install Sherwin Williams® Builders Solution™ Interior Latex Primer-Surfacer at finished drywall locations scheduled on the Drawings to receive painted or wall covering finishes.
- 2. Product shall improve drywall finish quality by filling and leveling rough and uneven drywall surfaces, creating uniform surfaces between drywall paper and joints, minimizing minor surface imperfections, and ensuring a smooth painted finish coat with uniform sheen.
- 3. When properly applied to a drywall surface with a minimum Level 4 finish, surface can meet Level 5 finish requirements.
- 4. Meets requirements of ASTM C840 and GA-214.
- 5. Install in strict accordance with manufacturer's written installation instructions.

- H. Miscellaneous Materials: As follows, recommended by gypsum board manufacturer:
1. Laminating Adhesives: Product recommended by gypsum board manufacturer.
 2. Steel drill screws complying with ASTM C 1002 for fastening gypsum board to steel members less than 0.03 inch thick.
 3. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch thick.
 4. Corrosion-resistant-coated steel drill screws of size and type recommended by board manufacturer for fastening cementitious backer units.
 5. Acoustical Sealant: Refer to Section 079200 – JOINT SEALANTS. Color shall be white only. No other colors permitted.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install steel framing to comply with ASTM C 754 and ASTM C 840.
1. Do not bridge building expansion joints with support systems; frame both sides of joints with furring and other supports as indicated.
 2. Secure hangers to structural support by connecting directly to structure where possible. Otherwise connect to inserts, clips, other anchorage devices, or fasteners, as indicated.
 3. Provide indirectly hung metal support system with carrying channels (main runners) spaced 4'-0" o.c., hangers 4'-0" o.c. along runners, and rigid furring members 16 inches o.c., unless otherwise indicated.
 4. Install directly hung grid suspension system, including perimeter wall track or angle, with members spaced and installed to comply with manufacturers instructions.
 5. Install steel studs with bottom and top runner tracks anchored to substrates. Isolate system from building structure to prevent transfer of loading and deflections into metal support system, both vertically and horizontally.
 6. Frame door and other openings with studs and runners of thickness, number, and arrangement to comply with manufacturer's recommendations for size of opening, weight and height of doors, and stud size, unless otherwise indicated.
 7. Install supplementary framing, runners, furring, blocking, and bracing at openings and terminations in gypsum board assemblies and where required to support other work that cannot be adequately supported on gypsum board alone.
- B. Install and finish gypsum board to comply with ASTM C 840 and as follows:
1. Isolate gypsum board construction from abutting structural and masonry work. Provide pre-manufactured edge trim on all exposed or cut edges of gypsum board that are exposed to view and contact dissimilar materials (i.e. window frames, door frames, and exposed structural components) in order to create a clean, finished edge condition. Exposed field cut edges of gypsum board panels without edge trim are not acceptable. Provide acoustical sealant as recommended by manufacturer. Acoustical sealant color shall be white. No gray, yellow or blue sealant will be allowed.
 2. Install sound attenuation blankets in partitions where indicated on the Drawings, without gaps, and support, where necessary, to prevent movement or dislocation.

3. Screw gypsum board to wood supports.
 4. Screw gypsum board to metal supports.
 5. Screw both layers to supports where double-layer work is indicated or otherwise required.
 6. Direct Bonding: Comply with manufacturer's recommendations where gypsum board is indicated to be directly bonded to substrate.
 7. Do not bridge building expansion joints. Leave a space of the width indicated between boards, and trim both edges for installation of sealant or gasket.
 8. Control Joints
 - a. Furnish and install wall and ceiling control joints as indicated and detailed on the Drawings. If not specifically indicated, provide a minimum as follows:
 - 1) Wall control joints shall be installed where a wall or partition runs in an uninterrupted straight plane exceeding 30 linear feet, or at a maximum wall area of 900 sq. ft.
 - 2) Wall control joints shall be continuous for the full height of the wall or partition in which they occur.
 - 3) At interior ceilings without perimeter relief, control joints shall be installed so that dimensions between control joints do not exceed 30 ft.
 - b. Control joints shall be installed in compliance with GA-216.
- C. Finishing Gypsum Board Assemblies: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects, and elsewhere, as required, to prepare gypsum board surfaces for decoration and levels of gypsum board finish indicated.
1. Apply joint tape over gypsum board joints to prevent cracks from developing in joint treatment at flange edges, except those with trim accessories having concealed face flanges not requiring taping.
 2. Apply joint tape over gypsum board joints and to trim accessories with concealed face flanges as recommended by trim accessory manufacturer and as required to prevent cracks from developing in joint compound at flange edges.
 3. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
 - a. Level 1 for above ceiling areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistive-rated assemblies and sound-rated assemblies.
 - b. Level 4 for gypsum board to receive wall coverings.
 - c. Level 4 for gypsum board to receive paint.
 4. For level 4 gypsum board finish, embed tape in finishing compound plus two separate coats applied over joints, angles, fastener heads, and trim accessories.
 5. Where level 1 gypsum board finish is indicated, apply joint compound and tape specified for embedding coat.

END OF SECTION 092900

SECTION 095113 – ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

A. Section Includes:

1. Acoustical ceiling panels.
2. Exposed grid suspension systems.
3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.
4. System Description: Continuous wall-to-wall.

B. Related Sections:

1. Section 092900 - GYPSUM BOARD.
2. Section 092226 – METAL SUSPENSION SYSTEMS.
3. Division 23 Sections - MECHANICAL WORK.
4. Division 26 Sections - ELECTRICAL WORK.

C. Abbreviations:

1. AC – Articulation Class.
2. ASHRAE – American Society of Heating, Refrigerating, and Air Conditioning Engineers.
3. CAC – Ceiling Attenuation Class.
4. HVAC – Heating , Ventilating, and Air Conditioning.
5. NRC – Noise Reduction Coefficient.
6. NVLAP – National Voluntary Laboratory Accreditation Program.
7. UL – Underwriters Laboratory.

1.3 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):

1. **ASTM A 641** - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
2. **ASTM A 653** - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvanealed) by the Hot-Dip Process.
3. **ASTM C 423** - Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
4. **ASTM C 635** - Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
5. **ASTM C 636** - Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

6. **ASTM E 84** - Standard Test Method for Surface Burning Characteristics of Building Materials.
 7. **ASTM E 1414** - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
 8. **ASTM E 1264** - Classification for Acoustical Ceiling Products.
 9. **ASTM E 1477** - Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- B. ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality".

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
- B. Samples: Minimum 6 inch x 6 inch samples of specified acoustical panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.
- C. Shop Drawings: Layout and details of acoustical ceilings. Show locations of items which are to be coordinated with, or supported by the ceilings.
- D. Acoustical Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification such as Underwriter's Laboratory (UL), of NRC, CAC, and AC.
 1. If the material supplied by the acoustical subcontractor does not have an independent laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the Architect's or Owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer to ensure fit and function.
- B. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
 1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
 - a. Flame Spread: 25 or less.
 - b. Smoke Developed: 50 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.7 PROJECT CONDITIONS

- A. Space Enclosure:
 - 1. HumiGuard Plus Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Products with HumiGuard Plus performance and hot dipped galvanized steel, aluminum, or stainless steel suspension systems can be installed up to 120 deg. F (49 deg. C) and in spaces before the building is enclosed, where HVAC systems are cycled or not operating. Cannot be used in exterior applications where standing water is present or where moisture will come in direct contact with the ceiling.

1.8 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to the following:
 - 1. Acoustical Panels with HumiGuard® Max and HumiGuard® Plus performance: sagging and warping.
 - 2. Acoustical panels with BioBlock® performance: growth of mold and mildew.
 - 3. Grid System: rusting and manufacturer's defects.
- B. Warranty Period:
 - 1. Ceiling System: Thirty (30) years from date of Substantial Completion.
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.9 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.

1. Acoustical Ceiling Units: Furnish quantity of full-size units equal to 5% of amount installed.
2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2% of amount installed.

PART 2-PRODUCTS

2.1 MANUFACTURERS

A. Ceiling Panels Basis of Design:

1. Armstrong World Industries, Inc., Lancaster, PA.
2. CerrainTeed Corporation, Malvern, PA.
3. Or Approved Equivalent.

2.2 ACOUSTICAL CEILING UNITS

A. Acoustical Tile Panels Type AT-1:

1. Surface Texture: Fine Texture.
2. Composition: Mineral Fiber, wet formed.
3. Color: White (WH).
4. Size: 24-inch x 24-inch x 5/8-inch.
5. Edge Profile: Angled Tegular.
6. Noise Reduction Coefficient (NRC): ASTM C423 Classified with UL label on product carton: 30.
7. Ceiling Attenuation Class (CAC): ASTM E1414/E1414M: Classified with UL Label on Product carton: 39.
8. Flame Spread: ASTM E1264; Class A,
9. Light Reflectance (LR) White Panel: ASTM E1414: 0.81,
10. Dimensional Stability: Standard, HumiGuard® Plus.
11. Recycle Content: Up to 62% total recycled content. (Total recycled content: pre-consumer, post-consumer, and post-industrial.
12. Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label.
13. Life Cycle Assessment: Third Party Certified Environmental Product Declaration (EPD).
14. Indoor Air Quality Certified to SCS-105 v4.2-2023.
15. USDA Certified Biobased Product.
16. Basis of Design: DUNE™, Item No. 1774, as manufactured by Armstrong World Industries, Inc.

2.3 SUSPENSION SYSTEMS FOR AT-1

A. Components: All main beams and cross tees, base metal, and end detail shall be commercial quality hot-dipped galvanized (galvanized steel) as per ASTM A 653. Main beams and cross tees shall be double-web steel construction with 15/16 inch type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel in polyester paint. Main beams and cross tees shall have rotary stitching.

1. Structural Classification: ASTM C 635 ID (Immediate Duty).

2. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
 3. Acceptable Product Basis of Design: Prelude® XL®15/16" Exposed Tee as manufactured by Armstrong World Industries, or approved equivalent. Provide this framing throughout where suspended ceilings are specified unless otherwise noted.
- B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
 - C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least three design load, but not less than 12 gauge.
 - D. Edge Moldings and Trim: As manufactured by Armstrong World Industries, Inc.
 - E. Accessories as manufactured by Armstrong World Industries, Inc. and as required for a complete installation.

2.4 ACOUSTICAL GYPSUM BOARD CEILING UNITS

- A. Acoustical Panels Type AT-2:
 1. Type: XX (gypsum base) ASTM E1264.
 2. Form: Not Applicable.
 3. Pattern: G, ASTM E1264.
 4. Composition: Gypsum lay-in panel with vinyl finish.
 5. Size: 24" x 24" x ½".
 6. Edge Detail: Square trim.
 7. Noise Reduction Coefficient (NRC): Not Applicable.
 8. Ceiling Attenuation Class (CAC): 40.
 9. Light Reflectance Coefficient (LRC): 0.78.
 10. Color: White.
 11. Flame Spread Classification: Class A, ASTM E1264.
 12. Acceptable Product – Basis of Design: CertainTeed PERFORMA® Vinylrock™ 1142-CRF as manufactured by CertainTeed Corporation, or approved equivalent.

2.5 SUSPENSION SYSTEMS FOR AT-2

- A. Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized) as per ASTM A 653. Main beams and cross tees shall be double-web steel construction with 15/16 inch type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel or aluminum in baked polyester paint. Main beams and cross tees shall have rotary stitching.
 1. Structural Classification: ASTM C 635 ID (Intermediate Duty).
 2. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
 3. Acceptable Product – Basis of Design: Prelude® XL® 15/16" Exposed Tee as manufactured by Armstrong World Industries, or approved equivalent. Provide this framing throughout where suspended ceilings are specified unless otherwise noted.

- B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least times three design load, but not less than 12 gauge.
- D. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner.
- E. Accessories as manufactured by Armstrong World Industries, Inc., as required for a complete installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations. (Exception: Armstrong HumiGuard® Max Ceilings).

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders. Install tile per layout pattern as shown on reflected ceiling plans on Drawings. If actual field conditions require a pattern layout different than indicated, consult Architect before proceeding with installation. Coordinate panel layout with mechanical and electrical fixtures.
- B. Pattern Direction: One way, align joints.
- C. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
 - 1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.3 INSTALLATION

- A. Follow manufacturer installation instructions.
- B. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.
- C. Suspend main beam from overhead construction with hanger wires spaced 4'-0" on center along the length of the main runner. Install hanger wires plumb and straight.

- D. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps. Secure to substrate with screw anchors spaced 16 inches o.c.. Cope exposed edges of intersecting exposed suspension members to produce flush intersections.
- E. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.
- F. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.
- G. Exposed Tile Edges. Edges of acoustical tile that is field cut for installation and exposed to view shall have cut edges of the tile painted with ceiling touch-up paint as recommended by the tile manufacturer. Touch-up paint color shall match color of tile face or uncut finished edges of tile. See paragraph 3.4.B.1 below.

3.4 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.
- B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage.
 - 1. Ceiling Touch-Up Paint, (Armstrong Item #5760, 8oz. bottles) (Armstrong Item #5761, quart size cans), "global white" latex paint shall be used to hide minor scratches and nicks in the surface and to cover field tegularized edges that are exposed to view.
- C. Remove any ceiling products that cannot be successfully cleaned and repaired. Replace with attic stock or new product to eliminate evidence of damage.

END OF SECTION 095123

SECTION 096514 – RESILIENT WALL BASE

PART 1 - GENERAL

1.1 THIS SECTION INCLUDES

- A. Wall base and installation accessories for installation in locations as shown on the Drawings and schedules and as indicated by the requirements of this section.
- B. Testing References – American Society for Testing and Materials (ASTM):
 - 1. **ASTM E648** – Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 - 2. **ASTM E662** – Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
 - 3. **ASTM F1861** – Standard Specification for Resilient Wall Base.
 - 4. **ASTM F137** – Standard Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus.
- C. South Coast Air Quality Management District (SCAQMD):
 - 1. **SCAQMD Rule 1168** – Adhesives and Sealant Applications.

1.2 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract (including General and Supplementary Conditions and Division 1 sections) apply to the work of this section.

1.3 RELATED SECTIONS

- A. Section 096519 – RESILIENT TILE FLOORING (LUXURY VINYL TILE AND PLANK).
- B. Section 096813 – MODULAR CARPET TILE.

1.4 QUALITY ASSURANCE AND REGULATORY REQUIREMENTS

- A. Select an installer who is competent in the installation of Mannington Wall Base.
- B. Provide types of wall base and accessories supplied by one manufacturer, including leveling and patching compounds, and adhesives.
- C. Provide wall base material to meet the following fire test performance criteria as tested by a recognized independent testing laboratory:
 - 1. ASTM E 648 Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I.
 - 2. ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less.

1.5 SUBMITTALS

- A. Submit shop Drawings, seaming plan, coving details, and manufacturer's technical data, installation, and maintenance instructions ("Mannington Wall Base Installation Instructions").
- B. Submit the manufacturer's standard samples showing the required colors for wall base, corners, and applicable accessories.
- C. Submit the manufacturer's certification that the wall base has been tested by an independent laboratory and complies with the required fire tests.

1.6 ENVIRONMENTAL CONDITIONS

- A. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.
- B. Store materials in a clean, dry, enclosed space off the ground, and protected from the weather and from extremes of heat and cold. Protect adhesives from freezing. Store wall base, adhesives, and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.
- C. Maintain a minimum temperature in the spaces to receive the wall base and accessories of 65°F (18°C) and a maximum temperature of 85°F (29°C) for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55°F (13°C) in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.
- D. Install wall base and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the wall base.

1.7 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials matching product installed as described below, packaged with protective coating for storage, and identified with labels clearly describing contents.
 - 1. Furnish 5% of total installed length of each type and color of resilient wall base installed, but not less than one full roll (100 feet.)

PART 2 - PRODUCTS

2.1 WALL BASE MATERIAL

- A. Basis of Design Manufacturer: Mannington Mills, Inc.
- B. Basis of Design Product: Mannington "Burke Base®" Thermoplastic Rubber Type TP Wall Base, matte finish. Color to be selected.

1. Thickness: 0.125-inch (3.2 mm).
2. Height: 4-inches (102 mm).
3. Style: Coved.
4. Size: 100-Ft seamless rolls.

C. Testing:

1. Product Compliance: ASTM F1861, Type TP, Group 1.
2. Flammability: Refer to paragraph 1.4.C.
3. Smoke Generation: Refer to paragraph 1.4.C.
4. Flexibility: Passes ASTM F137.

D. Environmental:

1. Indoor Air Quality: Floor Score Certified.
2. LEED Scoreboard: May contribute to LEED and Green Globe credits – LEED 2009: MRc5 Regional Materials; IEQ4.1 Low Emitting Adhesives; IEQ4.3 Low Emitting Materials – Flooring; LEED v4, IEQc2 – Low Emitting Materials.
3. Manufacturing: Calhoun, GA, USA.

E. Warranty: Limited 5-Year Commercial Warranty.

2.2 ADHESIVES

- A. Provide Mannington [MR-101 Acrylic Wall Base Adhesive] as recommended by the manufacturer. Adhesive must meet VOC content limit of SCAQMD Rule 1168.

2.3 ACCESSORIES

- A. For sealing joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine walls prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the wall base material.
- B. Inspect walls prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.
- C. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

- D. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the wall. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.2 PREPARATION

- A. Smooth wall surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, and other defects with a leveling compound as recommended by the manufacturer.

3.3 INSTALLATION OF WALL BASE

- A. Follow manufacturer's published installation guidelines.
- B. Apply wall 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 wall base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not scratch wall base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.
- G. Job-formed corners:
 - 1. Job-Formed Corners: Job formed/field fabricated cove base inside and outside corners shall be made with a cove base grooving tool using sufficient adhesive applied to outside corners in order to install cove base flush with gypsum board cornerbead with no gaps. Refer to Mannington written installation instructions for additional information.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible. Form by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate. Refer to Mannington written installation instructions.
- H. Heat weld or cold weld wall base seams as specified in Mannington's published installation guidelines.
- I. Maintain 65 deg. F – 85 deg. F (18.3 deg. C – 29.5 deg. C) for 48 hours. Do not perform maintenance for 24-hours.

3.4 CLEANING AND PROTECTION

- A. Perform initial maintenance according to the "Mannington Wall Base Installation Instructions."

END OF SECTION 096514

SECTION 096516 - RESILIENT HOMOGENEOUS VINYL SHEET FLOORING

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.
- B. Reference Standards
 - 1. American Society for Testing and Materials (ASTM):
 - a. **ASTM D2047** – Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
 - b. **ASTM E648** – Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 - c. **ASTM F137** – Standard Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus.
 - d. **ASTM F710** – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
 - e. **ASTM F925** – Standard Test Method for Resistance to Chemicals of Resilient Flooring.
 - f. **ASTM F970** – Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading.
 - g. **ASTM F1514** – Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color Change.
 - h. **ASTM F1515** – Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change.
 - i. **ASTM F1869** – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Sub-Floor Using Anhydrous Calcium Chloride.
 - j. **ASTM F1913** – Standard Specification for Vinyl Sheet Floor Covering Without Backing.
 - k. **ASTM F1914** – Standard Test Methods for Short-Term Indentation and Residual Indentation of Resilient Floor Covering.
 - l. **ASTM F2170** – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

1.2 SUMMARY

- A. Section Includes:
 - 1. Resilient Homogeneous Vinyl Sheet Flooring for locations as scheduled on the Drawings.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of product indicated.

- C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size samples of each resilient product color, texture, and pattern required.
- D. Product Schedule: For resilient products. Use same designations indicated on Drawings.

1.4 QUALITY ASSURANCE

- A. Installation Qualification: Contractors for floor covering installation shall be experienced in managing commercial flooring projects and provide professional installers, qualified to install the various flooring materials specified. An installer is “qualified” if trained, or a certified by Tarkett or a certified INSTALL (International Standards & Training Alliance) resilient floor covering installer.

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 Tarkett, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

1.6 PROJECT CONDITIONS

- A. Install resilient products after other finishing operations, including painting, have been completed.
- B. Maintain ambient temperatures within range recommended by Tarkett, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C) in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- C. Maintain the ambient relative humidity between 40% and 60% during installation.
- D. Until Substantial Completion, maintain ambient temperatures within range recommended by Tarkett, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

PART 2 - PRODUCTS

2.1 RESILIENT SHEET FLOORING – BASIS OF DESIGN

- A. Manufacturer: Tarkett North America Phone: (800) 899-8916; 30000 Aurora Rd., Solon, Ohio 44139; Phone (440) 543-8916; Web: www.tarkettna.com

2.2 IQ HOMOGENOUS VINYL SHEET FLOORING WITH PUR

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Tarkett; iQ Optima.

- B. Sheet Standard: ASTM F1913, Standard Specification for Vinyl Sheet Floor Covering Without Backing.
- C. Thickness/Wearlayer: 0.080 inch (2.0 mm).
- D. For size specify: 6 ft. 6 inches (2 m).
- E. Colors and Patterns: As selected by Architect from full range of industry colors.
- F. Test data:
 - 1. Flexibility (ASTM F137): Passes.
 - 2. Chemical Resistance (ASTM F925): Passes.
 - 3. Static Load Limit (ASTM F 970): Passes 250 psi.
 - 4. Resistance to Heat (ASTM F1514): $\Delta E \leq 8$.
 - 5. Resistance to Light (ASTM F1515): $\Delta E \leq 8$.
 - 6. Residual Indentation (ASTM F1914): Passes.
 - 7. Static Coefficient of Friction (ASTM D 2047): ≥ 0.5 SCOF.
 - 8. Flamability (ASTM E648, Critical Radiant Flux): Class 1 (≥ 0.45 W/cm²).
 - 9. Limited Commercial Warranty: 20 years.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation.
- B. Basis-Of-Design Adhesives: As recommended by Tarkett to meet site conditions:
 - 1. Tarkett 906 Conductive Adhesive (For use with iQ Granit SD and Toro SC).

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.
- B. 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.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to Tarkett written instructions to ensure proper adhesion of Resilient Flooring.

1. Prepare concrete substrates in accordance with ASTM F 710.
 - a. Concrete floors must be free of dust, solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, film-forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds, alkaline salts, excessive carbonation or laitence, mold, mildew, and other foreign materials that may affect dissipation rate of moisture from the concrete, discoloration or adhesive bonding.
 - b. Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.
 - c. Perform moisture testing as recommended by manufacturer. Proceed with installation only after substrates have been tested and meet the minimum requirements from the manufacturer in accordance with ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride or ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
 - d. A pH test for alkalinity must be conducted on the concrete floor prior to installation with results between 7 and 9. If the test results are not within the acceptable range, then installation must not proceed until the problem has been corrected.

- B. Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

- C. Floor covering shall not be installed over expansion joints.

- D. Do not install resilient products until they are same temperature as the space where they are to be installed.
 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT SHEET FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient sheet flooring.
- B. Resilient Sheet Flooring:
 1. Install with Tarkett adhesive specified for the site conditions and follow adhesive label for proper use.
 2. Install rolls in sequential order following roll numbers on the labels.
 3. Reverse non-pattern sheets as referenced in the Tarket Installation Instructions.
 4. Roll the flooring in both directions using a 100 pound three-section roller.

5. Vinyl sheet flooring must be welded.
Note: It is recommended to heat weld seams to provide a more sterile and water tight seam.
6. Tarkett Resilient Sheet Flooring may be flash coved. Provide 6-inch flash cove in locations as scheduled on the Drawings.
 - a. Use Johnsonite CFS-00-A Cove Filler Strip.
 - b. Net fit flooring material into the appropriate Johnsonite cove cap.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of 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 surfaces thoroughly.
 3. Damp-mop 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.
 1. No traffic for 24 hours after installation.
 2. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.
- D. Wait 72 hours after installation before performing initial cleaning.
- E. A regular maintenance program must be started after the initial cleaning.

END OF SECTION 096516

SECTION 096519 – RESILIENT TILE FLOORING (LUXURY VINYL TILE & PLANK)

PART 1 - GENERAL

1.1 THIS SECTION INCLUDES:

- A. Flooring and accessories as shown on the Drawings and schedules and as indicated by the requirements of this section.

1.2 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract (including General and Supplementary Conditions and Division 1 sections) apply to the work of this section.

1.3 RELATED SECTIONS

- A. Other Division 9 sections for floor finishes related to this section but not the work of this section.

1.4 QUALITY ASSURANCE AND REGULATORY REQUIREMENTS

- A. Select an installer who is competent in the installation of Mannington solid vinyl flooring with acrylic adhesive or two part epoxy.
- B. If required, provide resilient flooring and accessories supplied by one manufacturer, including leveling and patching compounds, and adhesives.
- C. Provide flooring material to meet the following fire test performance criteria as tested by a recognized independent testing laboratory:
 - 1. American Society for Testing and Materials (ASTM).
 - a. **ASTM E 648** Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I.
 - b. **ASTM E 662** (Smoke Generation) Maximum Specific Optical Density of 450 or less.

1.5 SUBMITTALS

- A. Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions (latest edition of "Mannington's Professional Installation Guide,") for flooring and accessories.
- B. Submit the manufacturer's standard samples showing the required colors for flooring and applicable accessories.
- C. Submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.

1.6 ENVIRONMENTAL CONDITIONS

- A. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.
- B. Store materials in a clean, dry, enclosed space off the ground, and protected from the weather and from extremes of heat and cold. Protect adhesives from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.
- C. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65°F (18°C) and a maximum temperature of 85°F (29°C) for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55°F (13°C) and a maximum temperature of 85°F (29°C) in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating appliances.
- D. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

PART 2 - PRODUCTS

2.1 RESILIENT FLOORING MATERIALS – Basis of Design: Mannington Select Abstract by Mannington Mills, Inc.:

- A. Specifications:
 - 1. Construction - Luxury Vinyl Tile (lvt) & Plank, Non-ortho phthalate.
 - 2. Overall Thickness – 0.098 inches (2.5 mm).
 - 3. Wearlayer Thickness – 30 mil (0.76 mm).
 - 4. Finish Layer – Quantum Guard Elite.
 - 5. Edge Treatment – Micro-Bevel.
 - 6. Sizes – Multiple, as specified by Architect.
 - 7. Specification (ASTM F-1700) - Class III, Type B.
- B. Testing:
 - 1. HUD/FHA – Passes.
 - 2. Flexibility (ASTM F137) - Passes - 1” Mandrel - No Crack/Break.
 - 3. Dimensional Stability (ASTM F2199) - Passes - Max 0.020 in/lin ft.
 - 4. Squareness (ASTM F540) - Passes - Max 0.010”.
 - 5. Static Load (ASTM F970 mod.) - Passes - 2,000 PSI; Residual Indent ≤ 0.005 ”.
 - 6. Residual Indentation (ASTM F1914) - Passes - < 8% Avg / 10% Single Value.
 - 7. Flooring Radiant Panel (ASTM E648) - Passes - Class 1; ≥ 0.45 watts/cm².
 - 8. Smoke Density (ASTM E662) - Passes - ≤ 450 .
 - 9. Slip Resistance (ASTM C1028) - Passes - ≥ 0.5 Leather; 0.6 Rubber.
 - 10. Resistance to Light (ASTM F1515) – Passes.

11. Chemical Resistance (ASTM F925) – Passes.
12. Resistance to Heat (ASTM F1514) – Passes.

C. Environmental:

1. Indoor Air Quality - FloorScore Certified; CDPH v1.1-2010.
2. Product Declarations – EPD, HPD.
3. Rapidly Renewable Content – Contains 2% rapidly renewable resource content.
4. LEED Scoreboard - LEED 2009: IEQ4.1 Low Emitting Adhesives; IEQ4.3 Low Emitting Materials – Flooring; LEED v4: Building Product Disclosure & Optimization - EPDs; IEQc2 - Low Emitting Materials.
5. mindful Materials - Visit mM Origin website, mindfulmaterials.origin.build, for current transparency information
6. Manufacturing – USA, ISO 14001 EMS & ISO 9001 QMS Registered, manufacturing required

D. Warranty: Limited 20 Year Commercial & 20 Year Finish Coat Warranty

2.2 WALL BASE MATERIALS

- A. Provide Mannington 1/8 in. (3.2 mm) thick, 4 in. (10.16 cm) high conforming to ASTM F 1861, Type TP - Rubber, Thermoplastic Style B – Cove.

2.3 ADHESIVES

- A. Provide Mannington [V-88 Adhesive] [V-95 Adhesive] [XpressStep Adhesive] [QuickStix Pre-Applied Adhesive] [MoistureLoc Adhesive] under the flooring as recommended by Manufacturer for existing flooring conditions.
- B. MR-101 Wall Base Adhesive at the wall base as recommended by manufacturer.

2.4 ACCESSORIES

- A. For patching, smoothing, and leveling monolithic subfloors (concrete, terrazzo, quarry tile, ceramic tile, and certain metals), provide Portland Cement-Based Underlayment.
- B. For sealing joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.
- C. LVT must have the ability to be chemically welded to adjoining broadloom carpet materials.
- D. Provide transition/reducing strips tapered to meet abutting materials.
- E. Provide threshold of thickness and width as required for flooring conditions.
- F. Provide resilient edge strips of width as required, of equal gauge to the flooring, homogeneous vinyl or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Architect from standard colors available.

- G. Provide [vinyl] [rubber] [metal] edge strips of width as required and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type edge strips for concealed anchorage or overlap-type edge strips for exposed anchorage.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.
- B. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.
- C. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.
- D. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.2 PREPARATION

- A. Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with Portland Cement-Based Underlayment as recommended by the flooring manufacturer.
- B. Remove paint, varnish, oils, release agents, sealers, and waxes. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds. Avoid organic solvents.
- C. Perform subfloor Relative Humidity and/or Calcium Chloride Tests, pH Tests, and Bond Tests as described in "Amtico Installation Guide," to determine if surfaces are dry, free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. Maximum levels to be determined based on adhesive choice and manufacturer's published installation instructions.
- D. Vacuum or broom-clean surfaces to be covered immediately before the application of flooring. Make subfloor free from dust, dirt, grease, and all foreign materials.

3.3 INSTALLATION OF FLOORING

- A. Install flooring in strict accordance with "Mannington's Professional Installation Guide" and any other product specific published installation instructions.

- B. Install flooring wall to wall before the installation of floor-set cabinets, casework, furniture, equipment, and movable partitions. Extend flooring into toe spaces, door recesses, closets, and similar openings as shown on the drawings.
- C. If required, install flooring on pan-type floor access covers. Maintain continuity of color and pattern within pieces of flooring installed on these covers. Adhere flooring to the subfloor around covers and to covers.
- D. Scribe, cut, and fit to permanent fixtures, columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.
- E. Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's instructions. Observe the recommended adhesive trowel notching, open times, and working times.

3.4 INSTALLATION OF ACCESSORIES

- A. Apply top set wall base to walls, columns, casework, and other permanent fixtures in areas where top-set base is required. Install base in lengths as long as practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.
- B. Corners: Job formed / field fabricated cove base inside and outside corners shall be made with cover base Grooving tool with sufficient adhesive to the outside corner in order to install flush with the corner bead with no gaps.
- C. Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.
- D. Place resilient edge strips tightly butted to flooring, and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.
- E. Apply [butt-type] [overlap] edge strips where shown on the drawings, [before] [after] flooring installation. Secure units to the substrate, complying with the edge strip manufacturer's recommendations.

3.5 CLEANING AND PROTECTION

- A. Perform initial maintenance according to the latest edition of the manufacturer's maintenance and warranty literature. Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades, or the placement of fixtures and furnishings.
- B. Do not wax, polish, seal or apply other finishes to the installed flooring unless specifically directed by end user.

END OF SECTION 096519

SECTION 096722 - SIKA EAGLE GRIP RESINOUS FLOOR & WALL COATING SYSTEM

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. A hospital grade, high performance resinous floor and wall coating system consisting of a polyaspartic primer coat, bonding coat, and topcoat; an epoxy grout coat; and broadcast recycled glass particles for integral color and texture. Total installation thickness of 38 mils (0.038-inch).
- B. Refer to Drawings, Sheet A601 – DOOR SCHEDULE & FINISH SCHEDULE for locations.

1.2 RELATED SECTIONS

- A. Section 017329 – CUTTING AND PATCHING.
- B. Section 024119 – SELECTIVE DEMOLITION.

1.3 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. **ASTM D4258** – Standard Practice for Surface Cleaning Concrete for Coating.
 - 2. **ASTM D4259** – Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application.
- B. International Organization for Standardization (ISO):
 - 1. **ISO 9001**- Quality Management Systems.
- C. International Concrete Repair Institute (IRCI):
 - 1. **IRCI Guideline 03732 - CSP3** – Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays – Concrete Surface Profile (CSP) 3: Light Shot Blast.

1.4 SUBMITTALS

- A. Comply with Section 013300 - SUBMITTAL PROCEDURES.
- B. Product Data: Submit manufacturer's product data, including physical properties and colors available.
- C. Product Samples: Submit Architectural Standard samples representative of the final finish, as applied. The Standard shall be approved in writing by the Architect and shall be the final standard of acceptance of the finish.

- D. Maintenance Instructions: Submit manufacturer's maintenance instructions, including maintenance procedures and materials, procedures for stain removal and surface repair, and recommended schedule for cleaning.
- E. Attic Stock: Refer to paragraph 2.2.C of this Section.

1.5 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Applicator: Use applicator experienced in application of specified materials for a minimum of five (5) years on projects of similar size and complexity. Applicator must be approved by the material manufacture. Provide list of completed projects including project name and location, name of Architect, name of material manufacturer, and approximate quantity of materials applied. This is a hospital grade decorative floor and wall system that requires expert installation techniques.
 - 2. Applicator's Personnel: Employ only persons trained for application of specified materials.
 - 3. Basis of Design Applicator:
 - a. Eagle Grip Coating Systems – Paint Corporation, 2635 Blaney Hill Road, Conway, AR 72032; Office: 501-664-3083; Fax: 501-664-1641; Web: www.eaglegripcoating.com
 - b. No substitutions allowed.
- B. Pre-application Meeting: Convene a pre-application meeting two (2) weeks before start of application of floor coating. Require attendance of parties directly affecting work of this section, including Contractor, Architect, applicator, and manufacturer's representative. Review surface preparation, priming, application, curing, protection, and coordination with other work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, batch or lot number, and date of manufacture. Do not store in direct sunlight or high heat conditions.
- B. Storage:
 - 1. Store materials in accordance with manufacturer's instructions.
 - 2. Keep containers sealed until ready for use.
 - 3. Do not subject material to excessive heat or freezing; do not apply material that has been subjected to excessive heat or freezing. Material subjected to excessive heat or freezing shall be separated from inventory and destroyed by mixing all three components. The solid reacted product shall be disposed of in environmentally sound and regulatory compliant manner.
 - 4. Shelf life: 1 Year after date of manufacture, in unopened containers, under normal conditions.

- C. Handling: Protect materials during handling and application to prevent damage or contamination.
- D. Condition materials for use to 60-85 degrees F for 24 hours prior to application.

1.7 SITE CONDITIONS

- A. Do not apply materials if floor or air temperature is below 60 degrees F or above 90 degrees F.
- B. Do not apply materials if relative humidity is above 85 percent or within 5° of dew point at time of application.
- C. Utilities, including electric, water, heat and finished lighting to be supplied by General Contractor.
- D. Maintain room temperature between 60-85 degrees F for 48 hours before, during and 48 hours after installation, or until cured.
- E. At the time of application ensure the minimum substrate temperature is above 60°F (15°C) and the substrate temperature is 5°F (3°C) above the measured dew point at the time of application.
- F. Erect suitable barriers and post legible signs at points of entry to prevent traffic and trades from entering the work area during application and cure period of the floor.
- G. Protection of finished floor from damage by subsequent trades shall be the responsibility of the General Contractor.

1.8 WARRANTY

- A. Provide a warranty covering materials and workmanship for a period of one year after date of installation.

1.9 MOCKUPS

- A. Apply mockup to verify selection made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Apply full-thickness mockup on 48-inch (1200 mm) square floor area in location as selected by Architect.
 - 2. Approved mockup may become part of the completed Work if undisturbed at the time of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Manufacturer shall be certified under ISO 9001: All liquid materials, including primers, resins, curing agents, finish coats, and sealants are manufactured and tested under an ISO 9001 registered quality system.

- B. Basis of Design Manufacturer shall be Sika Corp., Industrial Flooring, 201 Polito Avenue, Lyndhurst, NJ07071. No substitutions will be allowed. Phone 201.933.8800 Fax 201.933.6225 Jim Hendley 513-638-0519, hendley.jim@us.sika.com for local support. www.sikafloorusa.com

2.2 MATERIALS

- A. Sikafloor Eagle Grip Recycled Glass Floor and Wall Coating System consisting of:
1. Binder: Sikafloor®-511. An abrasion and UV-resistant two-component, solvent-free, high solids, low-viscosity, high strength polyaspartic resin system applied at the rate of 200 sq. ft. per gallon.
 2. Broadcast Particles: Decorative recycled glass.
 3. Binder Coat: Sikafloor®-511 applied at the rate of 200 sq. ft. per gallon.
 4. Broadcast Particles: Decorative recycled glass.
 5. Interim Coat: Sikafloor® 217. A low odor, 100% solids, epoxy resin system designed for high build coatings with decorative quartz particle applications. Apply at the rate of 80 sq. ft. per gallon.
 6. Topcoat: Sikafloor®-511 applied at the rate of 100 sq., ft. per gallon.
 7. Total Installed Thickness: 38 mils (0.038-inch).
- B. Concrete Floor Repair:
1. Sika Schonox SL Concrete:
 - a. A rapid-drying smoothing and finishing compound suitable for patching, smoothing, and leveling of new and existing concrete and cement substrates.
 - b. Furnish and install as required to prepare concrete floor slab for new Sika Eagle Grip Floor Coating System.
 - c. Install as per manufacturer's written instructions.
- C. Attic Stock: Furnish Owner one (1) 40 lb. box of recycled glass particles of the same approved batch mix color used for broadcast installation in the coating system in order to provide an accurate match of any future repairs to the installed coating system. Label box with content description and any applicable instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive Sika's Eagle Grip Recycled Glass Floor and Wall System Notify Architect if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected. Do not apply to substrate treatments for moisture, repair, or leveling not of the same Manufacturer.
- B. Do not apply Sika's Eagle Grip Recycled Glass floor and wall system to concrete less than 60 days old without using Sikafloor 1610 moisture tolerant primer. Consult Technical Service prior to application when concrete has not cured for 60 days.

- C. Do not apply Sika's Eagle Grip Recycled Glass System to sand-cement setting beds, regardless of condition. Sand-cement beds shall be removed to structural concrete substrate and re-leveled/sloped as necessary to achieve grade and/or adequate drainage.
- D. Do not apply to asphaltic or bitumen membranes, soft wood, aluminum, copper or fiberglass reinforced polyester/vinyl ester composites.
- E. Application to glazed or vitrified brick and tile, structural wood, steel shall be approved only with the Manufacturer's written recommendation

3.2 SURFACE PREPARATION

- A. Prepare concrete surfaces in accordance with manufacturer's instructions and ASTM D 4258.
- B. Remove dirt, oil, grease, wax, laitance, curing compounds, water-soluble concrete hardeners, and other surface contaminants.
- C. Remove sealers, finishes, and paints.
- D. Remove unsound concrete by scarifying, sand blasting, shot blasting, or high pressure water blasting.
- E. Chemical Surface Preparation:
 - 1. Chemical surface preparation (acid etching) is unacceptable and will void Manufacturer's warranty.
- F. Mechanical Surface Preparation:
 - 1. Mechanically abrade concrete surface in accordance with manufacturer's instructions.
 - 2. Leave concrete surface with an aggressive texture.
 - 3. Remove concrete dust.
 - 4. Conform to ASTM D-4259.
 - 5. Surface profile shall conform to ICRI Guideline 03732 CSP 3.

3.3 CONTROL JOINTS, CRACKS

- A. Provide repair and treatment of control joints and surface cracks utilizing manufacturer's standard materials and installation details.

3.4 COVE BASE (IF SCHEDULED ON DRAWINGS)

- A. Cove base shall be installed according to manufacturer's recommendations and standard details.
- B. Furnish and install cove base in locations as scheduled on the Drawings.
- C. Cove base shall consist of a troweled-applied radius/base mix with a termination strip or suitable transition installed at the top of the base.

- D. Cove base shall receive a broadcast and topcoat consistent with flooring system for a seamless transition and uniform appearance.

3.5 APPLICATION

- A. Repair concrete substrate as required using Sika Schonox SL cementitious repair/resurfacer in accordance with Manufacturer's instructions. Priming with Sikafloor 1610 and broadcast is necessary before installing Sika Schonox SL. Moving cracks may require special techniques to repair so that they do not telegraph thru the final coating.
- B. Do not add thinners to materials. No thinners shall be approved or allowed.
- C. For coverage rates, consult manufacturer's data sheet and this specification.
- D. Finish surface to be uniform texture, free of surface defects, and without porous areas.
- E. Follow Manufacturer's recommendations on terminations and connections to walls, drains, doorways, columns and floor-to-floor transitions.

3.6 CLEANUP

- A. Remove masking, draping, and other protection from adjacent surfaces.
- B. Remove remaining materials and debris from job site and dispose of them in according with local rules and regulations. Leave area in clean condition free of debris.

3.7 PROTECTION

- A. Protect Sika's Eagle Grip Recycled Glass floor coating during curing from traffic and chemical spillage. Based on air temperature of 73°F/23°C
 1. Foot Traffic: 6 to 8 hours.
 2. Medium Wheeled Loads: 12 to 24 hours.
 3. Full Cure: 7 days.

END OF SECTION 096722

SECTION 096813 – MODULAR CARPET TILE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Carpet removal (if required), new carpet and accessories for direct glue down, and installation in locations as shown and scheduled on the Drawings.
- B. General: The following publications of the issues listed below, but referred to hereinafter by basic designation, form a part of this specification to the extent as if bound herein:
 - 1. American Association of Textile Chemists and Colorists (AATCC):
 - a. **AATCC 16E** – Colorfastness to Light.
 - b. **AATCC 129** – Colorfastness to Ozone in the Atmosphere Under High Humidities.
 - c. **AATCC 134** – Electrostatic Propensity of Carpets.
 - d. **AATCC 175** – Test Method for Stain Resistance: Pile Floor Coverings.
 - 2. NFS International/American National Standards Institute (NFS/ANSI):
 - a. **NFS/ANSI 140** – Sustainable Assessment for Carpet.
 - 3. American Society for Testing & Materials (ASTM):
 - a. **ASTM D2859** – Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
 - b. **ASTM D5252** – Standard Practice for the Operation of the Hexapod Tumble Drum Tester.
 - c. **ASTM E648** – Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 - d. **ASTM E662** – Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
 - e. **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.
 - f. **ASTM E1745** – Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
 - g. **ASTM F710** – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
 - h. **ASTM F1861** – Standard Specification for Resilient Wall Base.
 - i. **ASTM F1869** – Standard Test Method for Measuring Water Vapor Emission Rate of Concrete Subflooring Using Anhydrous Calcium Chloride.
 - j. **ASTM F2170** – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

4. Collaborative for High Performance Schools (CHPS) 1350.
5. International Organization for Standardization (ISO):
 - a. **ISO 14001** – Environmental Management Systems.
6. U.S. Department of Commerce (DOC)/U.S. Consumer Product Safety Commission (CPSC):
 - a. **DOC FF 1 70** – Standard for the Surface Flammability of Carpet and Rugs.
7. South Coast Air Quality Management District (SCAQMD):
 - a. **SCAQMD Rule 1168** – Adhesive and Sealant Applications.

C. Abbreviations:

1. CRI – The Carpet and Rug Institute.
2. EPD – Environmental Product Declaration.
3. GSA – General Services Administration.
4. HPD – Health Product Declaration.
5. LEED – Leadership in Engineering and Environmental Design.
6. SDS – Safety Data Sheet.
7. TARR – Texture Appearance Retention Rating.

1.2 SUBMITTALS

- A. Layout Drawings: Show layout of each carpet type installation at 1/8" scale.
- B. Samples: For verification purposes, submit one 9" x 9" sample of each carpet required. Samples shall be accompanied by manufacturer's technical specification for each carpet required using terminology characteristics as listed in this specification. Also include a complete representation in sample form of all available colorations.
- C. Maintenance Data: Submit manufacturer's printed maintenance recommendations for the care, cleaning, and maintenance of the carpet, including detailed instructions pertaining to hot water extraction methods.

1.3 QUALITY ASSURANCE

- A. Flooring Contractor's Qualifications: Firm with not less than 5 consecutive years of experience in installation of commercial carpeting of type, quantity, and installation methods similar to the work detailed in this section.
- B. Manufacturer's Qualifications: Firm (carpet mill) with not less than 5 consecutive years of production experience with carpet similar to type specified in this section; whose published product literature clearly indicates general compliance of products with requirements of this section. Manufacturer must be ISO 14001 certified.

- C. Measurement Verification: Dimensions shown on Drawings are approximate. It is the Flooring Contractor's responsibility to verify all dimensions and job site conditions. Order sufficient yardage to fully carpet areas as indicated and to fill overage requirements as specified. No substitutions shall be permitted to make up for any shortage of material in overage or in carpet to be installed.
- D. Flooring Contractor shall be totally responsible for the accuracy of measurements of total yardage, individual floor yardage, and dye lot yardage requirements; no additional compensation shall be allowed for shortage of materials.
- E. Dye Lots: All carpet of the same type in continuous areas shall be from the same dye lots. Carpets that are piece dyed and are limited to dye batch sizes must be approved by the Architect. Transition from one dye lot to another shall be detailed on approved shop drawings and approved by Architect.

1.4 PRODUCT DELIVERY, STORAGE, & HANDLING

- A. Deliver carpet materials in original mill protective wrapping with mill register numbers and tags attached. Maintain wrappers and protective covers in place until carpet is ready for installation. Store inside, in well-ventilated area, protected from weather, moisture, and soiling.
- B. Maintain temperature and humidity levels in all areas where carpet is to be stored as detailed in manufacturer's published installation instructions.
- C. Deliver all required overages and maintenance stock to owner's specified location prior to beginning installation.

1.5 JOB CONDITIONS

- A. Environmental Conditions: Maintain temperatures in space in accordance with carpet or adhesive manufacturer's recommendations, but in no case less than 65 degrees F and no more than 85 degrees F for 24 hours prior to, during, and for 72 hours after installation. Subfloor temperature shall be a minimum 65 degrees F for 24 hours prior to and after installation.
- B. Precondition: All carpet shall be unboxed and spread in a room on site 24 hours prior to actual installation with the room preconditioned at a minimum of 65 degrees F and a maximum of 85 degrees F with humidity between 10% to 65%.
- C. Moisture: If required, perform a Calcium Chloride (ASTM F-1869) or Relative Humidity test (ASTM F-2170) on the concrete to detect the presence of moisture as directed by carpet manufacturer. Alkalinity tests must also be performed. Consult manufacturer's published installation instructions for maximum allowed moisture readings per backing type and adhesive. All tests shall be documented and results saved.

1.6 EXTRA STOCK

- A. General: Furnish 5% additional yardage of each carpet type required; extra yardage is over and above any overage provided by manufacturer. Normal manufacturing overage not to exceed 10% for under 1000 yards, and not to exceed 5% for over 1000 yards. Deliver overage materials to the Owner uncut in clearly marked dust-proof packages prior to commencement of work; store where directed.

PART 2 - PRODUCTS

2.1 BASIS OF DESIGN CARPET - Carpet Type CPT-1: Carpet shall meet the following minimum requirements – Mannington Commercial Mend Collection style Tailored Mends:

A. Specifications:

1. Construction - Tufted, Non-Ortho Phthalate – Textured Patterned Loop.
2. Face Fiber – Type 6,6 Nylon with Permanent Stain and Bleach Protection.
3. Dye Method – Solution.
4. Gauge – 1/10.
5. Stitches Per Inch – 10.
6. Pile Thickness – 0.084”.
7. Face Weight - 19 oz.
8. Density – 7886.
9. Size – 12” x 36”.
10. Primary Backing - 100% Woven Synthetic.
11. Secondary Backing - Infinity 2 Modular Reinforced Vinyl Composite Closed Cell Polymer.

B. Testing:

1. Dimensional Stability (Aachen Test) – Passes.
2. Electrostatic Propensity (AATCC 134) - Less than 3.0 kV.
3. Flooring Radiant Panel (ASTM E648) - Passes - Class 1; ≥ 0.45 watts/cm².
4. Smoke Density (ASTM E662) - Passes - ≤ 450 .
5. Methenamine Pill Test (ASTM D2859) – Passes.
6. Hexapod (ASTM D5252) TARR - 3.0.

C. Environmental:

1. NSF/ANSI 140 Certification - Infinity® 2 Modular – Gold.
2. Recycled Content - Contains recycled content.
3. Indoor Air Quality - CRI Green Label Plus Certified.
4. Product Declarations - EPD, HPD.
5. LEED Scoreboard - May contribute to LEED credits: LEED 2009: MRc5 Regional Materials; IEQ4.1 Low Emitting Adhesives; IEQ4.3 Low Emitting Materials - Flooring LEED v4: Building Product Disclosure & Optimization - EPDs; Building Product Disclosure & Optimization - Sourcing Raw Materials; Building Product Disclosure & Optimization - Material Ingredients; IEQc2 - Low Emitting Materials.

6. mindful MATERIALS - Visit mM Origin website, mindfulmaterials.origin.build, for current transparency information.
 7. Manufacturing - Calhoun, GA (USA) - ISO 14001 Registered.
- D. Pattern and Color: Understanding the importance of pattern and color for aesthetics, as well as appearance retention and maintainability, Architect reserves the right to reject any product or manufacturer based solely on pattern and color considerations.
- E. Warranties:
1. Definition of Lifetime: Lifetime is defined as the period from which materials are installed until the date in which the Owner removes them from service.
 2. Manufacturer's Lifetime Warranty, non-prorated, against product failure covering all costs including freight, labor, and material for the following: edge ravel, backing delamination, superior tuft bind in high traffic environments, wet or dry, static protection, moisture barrier-pre-coat and backing, wear - no more than 10% face yarn loss, and adhesive failure.
- F. Cationic Stain Resistance: Stain resistant properties must be permanent and not removable by commercial cleanings or abrasive wear, i.e., XGuard stain resistant treatment. Under GSA requirements stain resistant carpets must score no less than 8.0 (10.0 is the best) on the AATCC Red 40 Stain Scale. Test sample must first be exposed to 100 revolutions on the Taber Abrader (1,000-gram weight per H-18 wheel) and then abraded area must be stain tested using AATCC test method 175. Topical stain resistant treatments will not be acceptable. Stain resistant properties must be inherent and warranted for fifteen (15) years.
- G. Bleach Resistance: Will resist color loss from diluted bleach applications for a period of fifteen (15) years from the date of original installation, as with ColorSafe bleach resistance treatment. Diluted bleach applications means spills or splashes on the carpet of diluted bleach solutions (10% or less) of the type normally used for cleaning or disinfecting purposes.

2.2 ACCESSORIES

- A. Adhesives: Waterproof, non-flammable carpet adhesive recommended and approved by carpet manufacturer in writing for compatibility with carpet backing – [Infinity 2 Adhesive] [FreLock Tabs] [XpressStep Spray Adhesive]; be non-flammable, and meet the criteria of the CRI Green Label Plus Certification Program, SCAQMD Rule 1168, and CHPS 1350. SDS required on product used. Adhesive must have Lifetime Bond Warranty from carpet manufacturer.
- B. Wall Base Materials: Provide Mannington 1/8 in. (3.2 mm) thick, 4 in. (10.16 cm) high conforming to ASTM F 1861, Type TP - Rubber, Thermoplastic, Group 2 - Layered, Style B – Cove. Provide Wall Base adhesive as recommended by wall base manufacturer.
- C. Miscellaneous Materials: As recommended and approved in writing by manufacturer of carpet and selected by Flooring Contractor to meet project circumstance and requirements.

PART 3 - EXECUTION

3.1 CARPET REMOVAL

- A. Remove and dispose of all existing carpet and materials to make subfloor acceptable for installation if applicable.

3.2 INSPECTION

- A. General: Do not start work until work of other trades are substantially completed. Inspect surfaces to receive carpet and verify that all such work is complete to the point where this installation may properly commence. In the event of discrepancy, notify Contractor or Construction Manager. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved. Start of carpet installation indicates acceptance of subfloor conditions and full responsibility for completed work.

3.3 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's instructions and recommendations for installation of this type of carpet.
- B. Prepare the subfloor to ensure a successful installation as directed in carpet manufacturer's published installation guidelines.
- C. Employ use of manufacturer's recommended adhesive that requires no subfloor moisture testing when installed with standard adhesive and the slab meets ASTM F-710 including proof of the presence of an intact moisture vapor retarder per ASTM E-1745 (Class B or Better) in direct contact with the concrete slab, no standing water, no free liquids present, no evidence of moisture staining, no hydrostatic pressure, and a pH level that does not exceed 12. For all other conditions or when the above requirements are not met, the limits are in-situ relative humidity (maximum RH 95% per ASTM F-2170) and/or moisture vapor emissions (maximum 10 lbs./1,000 SF/24 hrs. per ASTM F-1869).
- D. On-grade and below-grade concrete slabs must have an approved vapor retarder (ASTM E-1745) which is properly installed (ASTM E-1643).
- E. Carpeting shall be installed in the format recommended by manufacturer or at Architect's approval. Cut carpet tile evenly and accurately to fit neatly at walls, columns, and projections. Extend carpet under open-bottomed and raised-bottom obstructions, and under removable flanges of obstructions.
- F. Installed carpet tiles shall be free from ripples, ravel, frays, and puckers. All loop pile carpets will demonstrate some fuzzy edges due to normal manufacturing conditions. Tractor tile joints and trim fuzzy edges or loop blossoms after installation.
- G. Expansion Joints: Do not bridge building expansion joints with continuous carpeting; provide for movement.

3.5 CLEANING AND PROTECTION

- A. Remove and dispose of debris and unusable scraps.
- B. Vacuum carpet using two motor, top loading, upright commercial machine with brush-only element, utilizing a high filtration dust bag. Remove spots in accordance with carpet manufacturer's guidelines and replace carpet where spots cannot be removed. Remove any protruding face yarn using sharp scissors. Be certain to trim any loose yarns or fibers at all seams.
- C. Following cleaning and vacuum carefully protect the carpeting from soiling and damage until final acceptance. Protection shall be accomplished by using approved protection paper. Edges shall be lapped 6 inches and secured with non-asphaltic tape. Covering shall be kept in repair and damaged portions replaced during the construction and move-in period.
- D. Maintenance Materials: Deliver usable scraps to Owner's designated storage space, properly packaged and identified. Dispose of smaller pieces as construction waste.

END OF SECTION 096813

SECTION 097720 – DECORATIVE FIBERGLASS REINFORCED WALL PANELS (FRP)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Prefinished polyester fiberglass reinforced plastic sheets and PVC trim, adhered to unfinished gypsum wallboard in locations as scheduled on the Drawings.
- B. Products Not Furnished or Installed under This Section:
 - 1. Gypsum substrate board.

1.2 RELATED SECTIONS

- A. Section 092900 – GYPSUM BOARD: Gypsum substrate board and metal stud framing.

1.3 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. **ASTM D256** – Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics: Izod Impact Strength (ft. lb. / inch).
 - 2. **ASTM D570** – Standard Test Method for Water Absorption of Plastics: Water Absorption (%).
 - 3. **ASTM D638** - Standard Test Method for Tensile Properties of Plastics: Tensile strength (psi) & Tensile Modulus (psi).
 - 4. **ASTM D790** - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials: Flexural Strength (psi) & Flexural Modulus (psi).
 - 5. **ASTM D2583** - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor: Barcol hardness.
 - 6. **ASTM D5319** – Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
 - 7. **ASTM E84** - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

- A. Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- B. Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.
- C. Selection Samples: Submit manufacturer's standard color pattern selection samples representing manufacturer's full range of available colors and patterns.

- D. Samples for Verification: Submit appropriate section of panel for each finish selected indicating the color, texture, and pattern required.
 - 1. Submit complete with specified applied finish.
 - 2. For selected patterns show complete pattern repeat.
 - 3. Exposed Molding and Trim: Provide samples of each type, finish, and color.
- E. Manufacturers Material Safety Data Sheets (MSDS) for adhesives, sealants and other pertinent materials prior to their delivery to the site. This is an information submittal for Contractor's use only and will not be reviewed or approved by the Architect.

1.5 QUALITY ASSURANCE

- A. Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with:
 - 1. ASTM E 84 (Standard Test Method for Surface Burning Characteristics of Building Materials):
 - a. Wall Required Rating – Class A.
- B. Sanitary Standards: System components and finishes to comply with:
 - 1. United States Department of Agriculture (USDA) requirements for food preparation facilities, incidental contact.
 - 2. Food and Drug Administration (FDA) 1999 Food Code 6-101.11.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials factory packaged on strong pallets.
- B. Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (range of 60 to 75°F) for 48 hours prior to installation.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Building is to be fully enclosed prior to installation with sufficient heat (70° F) and ventilation consistent with good working conditions for finish work
- B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.
 - 1. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

1.8 WARRANTY

- A. Furnish one year guarantee against defects in material and workmanship.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Basis of Design: Marlite; 1 Marlite Drive, Dover, OH 44622. 800-377-1221 FAX (330) 343-4668 Email: info@marlite.com www.marlite.com.
- B. Basis of Design Product:
 - 1. Marlite Standard FRP.

2.2 PANELS

- A. Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319.
 - 1. Coating: Multi-layer print, primer and finish coats or applied over-layer.
 - 2. Dimensions:
 - a. Thickness – 0.090 “ (2.29mm) nominal.
 - b. Width - 4'-0” (1.22m) nominal.
 - c. Length – 10'-0” (3.0m) nominal.
 - 3. Tolerance:
 - a. Length and Width: +/-1/8 “ (3.175mm).
 - b. Square - Not to exceed 1/8 “ for 8 foot (2.4m) panels or 5/32 “ (3.96mm) for 10 foot (2.4m) panels.
- B. Properties: Resistant to rot, corrosion, staining, denting, peeling, and splintering.
 - 1. Flexural Strength - 1.0×10^4 psi per ASTM D 790. (7.0 kilogram-force/square millimeter).
 - 2. Flexural Modulus - 3.1×10^5 psi per ASTM D 790. (217.9 kilogram-force/square millimeter).
 - 3. Tensile Strength - 7.0×10^3 psi per ASTM D 638. (4.9 kilogram-force/square millimeter).
 - 4. Tensile Modulus - 1.6×10^5 psi per ASTM D 638. (112.5 kilogram-force/square millimeter).
 - 5. Water Absorption - 0.72% per ASTM D 570.
 - 6. Barcol Hardness (scratch resistance) of 35 55 as per ASTM D 2583.
 - 7. Izod Impact Strength of 72 ft. lbs./in as per ASTM D 256.
- C. Back Surface: Smooth. Imperfections which do not affect functional properties are not cause for rejection.

D. Front Finish: In accordance with preapproved sample.

1. Color: No. 100 - White.
2. Surface S100G, Smooth Texture.
3. Fire Rating Class A.
4. Size:
 - a. Marlite FRP
 - 1) 48" x 108" x 0.090" nom.
 - 2) 48" X 120" BY 0.090 nom.
 - 3) Coordinate length (height) with ceiling height of rooms scheduled to receive FRP.

2.3 BASE

A. Marlite Base Molding for 0.090" (2.29mm) thick FRP Panels:

1. Color: To be selected.
2. Profiles:
 - a. M 612 FRP Base Molding, 10' length.
 - b. M 651 Inside Corner.
 - c. M 660 Outside Corner.
 - d. M 620 LH End Cap.
 - e. M 625 RH End Cap.

2.4 MOLDINGS

A. PVC Trim: Thin-wall semi-rigid extruded PVC:

1. M 350 Inside Corner, 8' or 10' length as required.
2. M 360 Outside Corner, 8' or 10' length as required.
3. M 365 Division, 8' or 10' length as required.
4. M 370 Edge, 8' or 10' length as required.
5. Color: White.

2.5 ACCESSORIES

A. Fasteners: Non-staining nylon drive rivets.

1. Match panel colors.
2. Length to suit project conditions.

B. Adhesive: Either of the following construction adhesives complying with ASTM C 557.

1. Marlite C-551 FRP Adhesive - Water- resistant, non-flammable adhesive.
2. Marlite C-915 Construction Adhesive - Flexible, water-resistant, solvent based adhesive, formulated for fast, easy application.
3. Titebond Advanced Polymer Panel Adhesive – VOC compliant, non-flammable, environmentally safe adhesive.

C. Sealant:

1. Marlite Brand MS-250 Clear Silicone Sealant.
2. Marlite Brand MS-251 White Silicone Sealant.
3. Marlite Brand - Color Match Sealant.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface.
1. Verify that stud spacing does not exceed 24" (61cm) on-center.
- B. Repair defects prior to installation.
1. Level wall surfaces to panel manufacturer's requirements. Remove protrusions and fill indentations.

3.2 INSTALLATION

- A. Comply with manufacturer's recommended procedures and installation sequence.
- B. Cut sheets to meet supports allowing 1/8" (3 mm) clearance for every 8 foot (2.4m) of panel.
1. Cut and drill with carbide tipped saw blades or drill bits, or cut with shears.
 2. Pre-drill fastener holes 1/8" (3mm) oversize with high speed drill bit.
 - a. Space at 8" (200mm) maximum on center at perimeter, approximately 1" from panel edge.
 - b. Space at in field in rows 16' (40.64cm) on center, with fasteners spaced at 12" (30.48 cm) maximum on center.
- C. Apply panels to board substrate, above base, vertically oriented with seams plumb and pattern aligned with adjoining panels.
1. Install panels with manufacturer's recommended gap for panel field and corner joints.
 - a. Adhesive trowel and application method to conform to adhesive manufacturer's recommendations.
 - b. Drive fasteners for snug fit. Do not over-tighten.

- D. Apply panel moldings to all panel edges using silicone sealant providing for required clearances.
 - 1. All moldings must provide for a minimum 1/8 " (3mm) of panel expansion at joints and edges, to insure proper installation.
 - 2. Apply sealant to all moldings, channels and joints between the system and different materials to assure watertight installation.

3.3 CLEANING

- A. Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.
- B. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF SECTION 097720

SECTION 098453 - SOUND BARRIER MULLION TRIM CAP

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.
- B. REFERENCE STANDARDS
 - 1. American Society for Testing and Materials (ASTM):
 - a. **ASTM E84** – Standard Test Method for Surface Burning Characteristics of Building Materials.
 - b. **ASTM E90** – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - c. **ASTM G21** – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
 - 2. International Organization for Standardization / International Electrotechnical Commission (ISO/IEC):
 - a. **ISO/IEC Standard 17025** – General Requirements for the Competence of Testing and Calibration Laboratories.
 - 3. American National Standards Institute/Underwriters Laboratories (ANSI/UL):
 - a. **ANSI/UL 2079** – Tests for Fire Resistance of Building Joint Systems.
 - 4. International Organization for Standardization (ISO):
 - a. **ISO 9001** – Quality Management Systems.
 - 5. Aluminum Association (AA).

1.2 SUMMARY

- A. Section includes fire-rated and non-rated sound barrier mullion trim caps providing sound transmission control at interior partitions terminating at existing aluminum curtain wall framing in locations as shown on the Drawings.
- B. Related Sections:
 - 1. Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
 - 2. Section 079200 - JOINT SEALANTS for joint sealing.
 - 3. Section 092900 - GYPSUM BOARD for interior wall construction

1.3 ACTION SUBMITTALS

- A. Product Data:
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for sound barrier wall end cap system.
- B. Shop Drawings:
 - 1. Include typical dimensioned cross-section(s) at the location where drywall partition terminates at the perimeter storefront or curtain wall, indicating:
 - a. Dimensions.
 - b. Finish.
- C. Samples: For each exposed product and for each color and texture specified.
 - 1. Size: 12 inches (304.8 mm).

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each sound barrier mullion trim cap assembly, for ASTM E 90 tests performed by a qualified third party testing agency.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of aluminum extrusions and anodizing shall be ISO-9001 certified.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- C. Testing Agency Qualifications: ASTM E 90 and ANSI / UL2079 testing to be performed by laboratory accredited by IAS as complying with ISO/IEC Standard 17025.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver sound barrier mullion trim caps until spaces to receive them are clean, dry, and ready for their installation.
- B. Store sound barrier mullion trim caps in original undamaged packaging inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace sound barrier mullion trim caps that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Ten years limited warranty from date of Substantial Completion.
 - 2. Limited warranty does not cover adjacent products or improper installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide the following:
 - 1. Basis of Design: MULL-it-OVER Products, Grand Rapids, MI; Sound barrier mullion trim cap systems; Telephone: (616) 730-2162; www.mullitoverproducts.com or approved equivalent.

2.2 SYSTEM DESCRIPTION

- A. General: Provide sound barrier mullion trim caps of design, basic profile, materials, and operation indicated. Provide units with capability to accommodate variations in adjacent surfaces.
 - 1. Furnish units in lengths of sufficient additional length to allow for field trimming to required length to match variations in construction tolerances of adjacent systems.

2.3 PERFORMANCE REQUIREMENTS

- A. Sound Transmission:
 - 1. Single Sided Installations: STC 51 or better.
 - 2. Double-Sided Installations: STC 57 or better.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Mullion trim cap to be sized to accommodate thermal movement.
- C. Fire Rating for Use with Rated Partitions Only:
 - 1. Standard Conditions: Assembly fire rating of 1 hour per ANSI/UL 2079. UL Joint System No. WW-S-1039 for 1-hour assembly.
 - 2. Unique or Non-Standard Conditions: Subject to review and engineered ruling by manufacturer.
 - 3. Refer to Drawings for any locations of rated partitions terminating at window mullions.

2.4 SOUND BARRIER MULLION TRIM CAP

- A. Sound Barrier Mullion Trim Cap:
 - 1. Basis of Design Products: MULL-it-OVER Products; Mullion Trim Cap.
- B. Profile: 55 Classic Mullion Trim Cap.

2.5 COMPONENTS

- A. Aluminum Extrusions:
 - 1. Thickness: 0.125 inches.
 - 2. Profile: As selected and approved by Architect to allow solid attachment and fastening to the partition wall framing.
- B. Sound Absorbing Foam:
 - 1. Resistant to smoke, flame, and microbial growth.
 - 2. Fire Rating: ASTM E 84 Class 1.
 - 3. Fungi Resistance: Zero rating per ASTM G 21.
- C. Compressible Foam: Between edge of extrusion and interior face of storefront or curtain wall glass.
 - 1. Thickness: Standard ½-inch (13 mm), ¾-inch (19.1 mm), or 1-1/2" (38.1 mm) as required to accommodate mullion deflection.
 - 2. Color: Light Gray.
- D. Intumescent Foam for Fire Rated Trim Caps Only.
 - 1. Between sound absorbing material and face of storefront or curtain wall mullion.
 - 2. Thickness: 0.070-inch (1.8 mm) thick, supported by 0.035-inch (0.9 mm) steel impaling clips.
- E. Fasteners:
 - 1. Self tapping or appropriate #8 threaded fastener.
 - 2. Compatible with all materials that fasteners will contact and will not cause galvanic corrosion.
- F. Snap Cover: Snap-on fastener cover.
- G. Acoustical Sound Sealant: Acrylic latex based.

2.6 ACCESSORIES

- A. Provide necessary and related parts and tools to complete installation.

2.7 FABRICATION

- A. Extrusions and generic profiles to be shipped in custom lengths as required to meet project requirements or shipped in standard incremental foot lengths and cut to exact length on jobsite.

2.8 FINISHES

- A. Exposed surfaces of exposed aluminum extrusion:
 - 1. Standard Finish: Clear anodized finish.
- B. Finishes:
 - 1. Aluminum - clear anodize:
 - 2. Clear anodized finish in accordance with AA-M10 C22 A41:
 - a. AA – Aluminum Association.
 - b. M10 – Mechanical (M) Finish: Unspecified as fabricated.
 - c. C22 – Chemical (C) Finish: Medium Matte Etch.
 - d. A41 – Anodic (A) Coatings: Clear, Architectural Class I (0.7 mil to 1.0 mil anodic coating).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine walls and adjacent storefront or curtain wall for suitable conditions where sound barrier wall end cap will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Measure and cut sound barrier wall end cap to proper lengths.
- B. Notch around horizontal mullions, sills, or other obstructions leaving appropriate gap for differential movement between the sound barrier wall end cap and the obstruction.
- C. Apply continuous bead of acoustical sealant to the acoustical foam surface that will be in contact with the drywall edge.
- D. Place sound barrier wall end cap on the vertical surface of the drywall partition wall and loosely install fasteners in the top and bottom slotted holes of the wall end cap.

- E. Plumb the wall end cap leaving recommended gap spacing of a minimum 5/16" between the interior glass surface and the aluminum return leg of the wall end cap. The closed cell foam gasket material will be in contact with the glass surface allowing for differential movement between the mullion cap and the curtain wall. Increase the gap spacing if recommended by the Engineer of Record or curtain wall manufacturer.
- F. Tighten top and bottom fasteners to secure end cap.
- G. Install additional fasteners at 12 inches on center, minimum.
- H. Install snap cover to conceal fasteners.
- I. Apply sealant at joints of dissimilar materials as desired.

3.3 CLEANING

- A. After work is complete in adjacent areas, clean exposed surfaces with suitable cleaner that will not harm or attack the finish.

3.4 PROTECTION

- A. Protect sound barrier wall end caps from damage during installation, general construction activities, and until turnover of structure.

END OF SECTION 098453

SECTION 099110 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.
- B. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
- C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
 - 1. Labels: Do not paint over Underwriters Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.3 SUBMITTALS

- A. General: Submit the following according to Conditions of the Contract and Specification Section 013300 – SUBMITTAL PROCEDURES.
- B. Product data for each paint system specified, including block fillers and primers.
 - 1. Provide the manufacturer's technical information including label analysis and instructions for handling, storage, and application of each material proposed for use.
 - 2. List each material and cross-reference the specific coating, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.
- C. Samples for initial color selection in the form of manufacturer's color charts.
 - 1. After color selection, the Architect will furnish color chips for surfaces to be coated.

- D. Samples for Verification Purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate in 12" squares.
 - 1. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.
 - 2. Submit samples on the following substrates for the Architect's review of color and texture only:
 - a. Painted Wood: Provide two 12-inch-square samples of each color and material on hardboard.
 - b. Stained or Natural Wood: Provide two 4-by-8-inch samples of natural and stained wood finish on actual wood surfaces.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.
- B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
- C. Field Samples: On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface until required sheen, color, and texture are obtained; simulate finished lighting conditions for review of in-place work.
 - 1. Final acceptance of colors will be from job-applied samples.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.
 - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).
- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
 - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include the following:
 - 1. Basis of Design: Sherwin Williams Company (S-W).
 - 2. No substitutions permitted as per Owner.

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.
- B. Material Quality: Provide the manufacturer's best-quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish the manufacturer's material data and certificates of performance for proposed substitutions.
- C. Colors: Provide color selections made by the Architect from the manufacturer's full range of standard colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.
 - 1. Do not begin to apply paint until unsatisfactory conditions have been corrected.
 - 2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing about anticipated problems using the specified finish-coat material with substrates primed by others.
 - 2. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

- b. Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
 - c. When transparent finish is required, backprime with spar varnish.
 - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
 - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.
 - 3. Ferrous Metals: (*Note: Paint all new exposed ferrous metals on the exterior of the building*) Clean ungalvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council (SSPC).
 - a. Blast steel surfaces clean as recommended by the paint system manufacturer.
 - b. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.
 - 4. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
 - 5. Gypsum Board Surfaces: Furnish and install special drywall primer-surfacer treatment for all gypsum board surfaces scheduled to receive paint of wall covering. Refer to Section 092900 – GYPSUM BOARD, paragraph 2.2.G for additional information.
- D. Materials Preparation: Carefully mix and prepare paint materials according to manufacturer's directions.
- 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
 - 3. Use only thinners approved by the paint manufacturer and only within recommended limits.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 - 1. Paint colors, surface treatments, and finishes are indicated in the schedules.
 - 2. Provide finish coats that are compatible with primers used.

3. The number of coats and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions.
 4. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
 5. The term exposed surfaces includes areas visible when permanent or built-in fixtures, convactor covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
 6. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 7. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
 8. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
 10. Finish exterior doors on tops, bottoms, and side edges same as exterior faces.
 11. Sand lightly between each succeeding enamel or varnish coat.
 12. Omit primer on metal surfaces that have been shop-primed and touch-up painted.
- C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.
- D. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to the manufacturer's directions.
1. Brushes: Use brushes best suited for the material applied.
 2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
 4. Spray Application:
 - a. Confine spray application to metal framework and similar surfaces where hand brush work would be inferior.

- b. Wherever spray application is used, apply each coat to provide the equivalent hiding of brush-applied coats. Do not double back with spray equipment for the purpose of building up film thickness of two coats in one pass.
- E. Minimum Coating Thickness: Apply materials no thinner than the manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.
- F. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- G. Pigmented (Opaque) Finishes: Completely cover to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- H. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.
 - 1. Provide satin finish for final coats.
- I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with specified requirements.

3.4 FIELD QUALITY CONTROL

- A. The Owner reserves the right at his expense to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:
 - 1. Quantitative materials analysis.
 - 2. Abrasion resistance.
 - 3. Apparent reflectivity.
 - 4. Flexibility.
 - 5. Washability.
 - 6. Absorption.
 - 7. Accelerated weathering.
 - 8. Dry opacity.
 - 9. Accelerated yellowness.
 - 10. Recoating.
 - 11. Skinning.
 - 12. Color retention.
 - 13. Alkali and mildew resistance.

- B. If test results show material being used does not comply with specified requirements, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing, repaint surfaces coated with rejected paint, and remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

- A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
 - 1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 EXTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates indicated. Paint products listed are based on Sherwin Williams Company (S-W).
- B. Ferrous Metal: (Metal Doors and Frames, Railings, and Miscellaneous Metals) Note: a separate primer is not required on shop-primed items.
 - 1. Semi-Gloss Alkyd Urethane Enamel: Two finish coats over primer.
 - a. Touch up shop primer with SW B66-1300 Series, Pro-Cryl® Universal Water Based Primer.
 - b. First and Second Coats: SW B53-1150 Series, WB Alkyd Urethane Enamel, Semi-Gloss.

- C. Zinc-Coated Metal: (Exposed Galvanized Metal)
 - 1. Semi-Gloss Acrylic Enamel: Two finish coats.
 - a. First and Second Coats: Semi-Gloss Acrylic Enamel.
 - 1) S-W: Pro Industrial™ DTM Acrylic Semi-Gloss Enamel B66W01153 Series – Deep Base (Tint).

- D. Concrete:
 - 1. Primer: Acrylic latex primer/sealer. S-W Loxon® Concrete & Masonry Primer/Sealer Interior/Exterior Latex A24W08300 Series – White.
 - 2. First and Second Coats: S-W ConFlex XL Smooth Elastomeric High Build Coating, A5-400 Series.

- E. Concrete Block (if indicated on Drawings):
 - 1. Primer: Acrylic resin surfacer. S-W Loxon® Block Surfacer, A24W00200 Series.
 - 2. First and Second Coats: S-W ConFlex XL Smooth Elastomeric High Build Coating, A5-400 Series.

- F. Concrete & Asphalt Pavements: (Parking lot striping, hazardous area striping, HC parking symbols, concrete curb painting).
 - 1. Traffic Paint, White color: S-W ProMar® Alkyd Fast Dry Zone Marking Paint, TM5494 White.
 - 2. Traffic Paint, Yellow color: S-W ProMar® Alkyd Fast Dry Zone Marking Paint, TM5495 Lead Free Yellow.
 - 3. Traffic Paint, Red color: S-W Setfast® Premium Alkyd Zone Marking Paint, A302 Red.

3.8 INTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates indicated. Paint products listed are based on Sherwin Williams Company (S-W).

- B. Gypsum Drywall Systems: (Gypsum board walls scheduled for paint)
 - 1. Acrylic Latex Eg-Shel (Satin): Three coat system, primer + 2 finish coats.
 - a. Primer: S-W PVA Interior Latex Primer & Sealer, B28W08000 White.
 - b. First and Second Coats: S-W ProMar® 200 Zero VOC Interior Latex Eg-Shel, B20W12651 Extra White.

- C. Painted Woodwork: (Millwork, Doors, and miscellaneous wood where indicated on Drawings to be painted.)
1. Semi-Gloss: Three coat system, primer + 2 finish coats.
 - a. Primer: S-W Prep Rite® Problock® Interior/Exterior Latex Primer/Sealer, B51W00620 White.
 - b. First and Second Coats: Interior Semi-Gloss water-based epoxy:
 - 1) S-W Pro Industrial™ Pre-Catalyzed Waterbased Epoxy, K46-150 Series Semi-Gloss, Extra White.
- D. Stained Woodwork: (Millwork and miscellaneous trim where indicated on Drawings to be stained).
1. Stained, Varnish Rubbed Finish: Two finish coats over stain.
 - a. First Stain Coat: Oil-type interior wood stain.
 - 1) S-W Wood Classics® 250 VOC Interior Oil Stain, A49T00804 Clear Base.
 - b. Second and Third Coats: Waterborne polyurethane varnish.
 - 1) S-W Wood Classics® Waterborne Polyurethane Varnish, A68F00090 Satin Clear.
- E. Ferrous Metal: (Hollow Metal Doors and Frames)
1. Semi-Gloss Epoxy Finish: Two finish coats over primer.
 - a. Primer: Synthetic acrylic quick-drying, rust-inhibiting primer.
 - 1) S-W Pro Industrial™ Pro-Cryl Universal Primer, B66W00310 Off White.
 - b. First and Second Coats: S-W Pro Industrial™ Pre-Catalyzed Waterbased Epoxy, K46-150 Series Semi-Gloss.

END OF SECTION 099110

SECTION 099720 –WALL COVERINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Vinyl wall covering. Drawing designation WC (Wall Covering).
- B. Refer to Drawings, Sheet A601 – DOOR & WINDOW SCHEDULE / FINISH SCHEDULES and Sheet A701 – 4th FLOOR FINISH PLAN for specific vinyl wallcovering materials, manufacturers, and installation locations.

1.2 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. **ASTM E84** – Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

- A. Contractor shall submit the following:
 - 1. Product Data: For each product indicated.
 - 2. Shop Drawings: Include location and extent of each wall covering type, seam locations and termination points.
 - 3. Samples: For each for each wall covering and for each color and texture required. Include sample sets with specified treatments applied.
 - 4. Product Schedule: Use same room designations as indicated on Drawings.
 - 5. Maintenance data.

1.4 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: Provide wall coverings with flame-spread and smoke-developed indices of not more than 25 and 450, respectively, per ASTM E 84.

PART 2 - PRODUCTS

2.1 VINYL WALL COVERING (WC)

- A. Basis of Design Manufacturer:
 - 1. Dor It Modern, Inc., info@dropitmodern.com.
- B. Basis of Design Product (WC-1, WC-2):
 - 1. Drop It Modern Wall Covering, PVC Free, Type II.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Preparation:

1. Clean substrates of substances that could impair wall covering's bond, including mold, mildew, oil, grease, incompatible primers, and dirt.
2. Prepare substrates to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, and defects.
3. Painted Surfaces: Treat areas susceptible to pigment bleeding.
4. Metals: If not factory primed, clean and apply rust-inhibitive zinc primer.
5. Moisture Content: Maximum of 5 percent on new concrete and concrete masonry units when tested with an electronic moisture meter.
6. Prime new gypsum board with primer recommended by wall covering manufacturer.
7. Check painted surfaces for pigment bleeding. Sand gloss, semigloss, and eggshell finishes with fine sandpaper.
8. Acclimatize wall covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.

B. Cut panels in roll number sequence. Change run numbers at partition breaks and corners only.

C. Install seams vertical and plumb, with no horizontal seams.

D. Match pattern 72 inches (1830 mm) above finish floor.

E. Remove excess adhesive at finished seams, perimeter edges, and adjacent surfaces using cleaning methods recommended by wall covering manufacturer. Replace strips that cannot be cleaned.

END OF SECTION 099720

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SECTION 102123 - CUBICLE TRACK AND CURTAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section includes the following:
 - 1. Curtain track and curtain carriers
 - 2. Cubicle Curtains
 - 3. IV track and bottle holders

1.3 PERFORMANCE REQUIREMENTS

- A. Curtains: Provide curtain fabric with the following characteristics:
 - 1. Fabrics are flame resistant and are identical to those that have passed NFPA 701 when tested by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - a. Identify fabrics with appropriate markings of applicable testing and inspecting agency

1.4 SUBMITTALS

- A. Product Data: Include durability, laundry temperature limit, fade resistance, and fire test response characteristics for each type of curtain fabric indicated.
- B. Shop Drawings: Show layouts and types of cubicles, size of curtains, number of carriers, anchorage details, and conditions requiring accessories. Indicate dimensions taken from field measurements.
- C. Samples for Initial Selection: For each type of curtain material specified.
- D. Samples for Verification: For each type of product required. Samples of size indicated below.
 - 1. Curtain Fabric: 12 inches square swatch. Mark top and face material.
 - 2. Mesh Top: Not less than 4 inches

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install cubicles until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at levels indicated for project when occupied for its intended use.

PART 2 – PRODUCTS

2.1 CURTAIN TRACKS

- A. Basis of Design Manufacturer: Cubicle curtain track shall be Model IFC-98, as manufactured by Imperial Privacy Systems LLC or Architect approved equal.
- B. Extruded Aluminum Track: Cubicle track shall be extruded 6063-T5, 1 3/8" by 3/4" by .058" 3/4 by .058" wall thickness, one piece, and surface mounted.
 - 1. Curved track: Factory-fabricated, 12 inch radius bends.
 - 2. Finishes: Satin anodized or electrostatic white paint finish.
- C. Track Accessories: Fabricate splices from same material and with same finish as track.
 - 1. End Stop: Fast-Cap no drill track end cap.
- D. Curtain Carriers: IFC-100 carriers two wheel nylon roller with steel bead chain and hard aluminum hook, 2.2 per foot.

2.2 CURTAINS

- A. Manufacturer: Subject to compliance with requirements, provide products by following:
 - 1. Basis of Design Fabric Manufacturer: Imperial Privacy Systems LLC
 - 2. Pattern Name: _____
 - 3. Color: _____
- B. Curtain Grommets: Two-piece, rolled-edge, rustproof aluminum, spaced not more than 6 inches o.c.; machined into top hem.
- C. Mesh Top: No. 50, 20" Wide, 1/2" Hole flame resistant nylon mesh
- D. Curtain Tieback: Flame resistant, woven strap with self adhesive aluminum wall plate.
- E. Baton: 3/8 inch diameter fiberglass shaft with hook.

2.3 CURTAIN FABRICATION

- A. Fabricate curtains to comply with the following requirements:
 - 1. Width equal to track length from which curtain is hung plus 10 percent added fullness, but not less than 12 inches added fullness.
 - 2. Length equal to floor-to-ceiling height minus 20 inches from finished ceiling at top, and minus distance above the finished floor at bottom as follows:
 - a. Cubicle Curtains: 15 inches
 - b. Shower Curtains: 2 inches
 - 3. Top Hem: To be 1-1/2 inches wide triple thickness, and double locked stitched.

4. Mesh Top: To be No. 50, 20" Wide, ½" Hole double lock stuck to top of curtain fabric, with a ½ wide triple thick top seam. Mesh to have a 1-1/4 inch 100% flame resistant polyester tape double lock stitched into top hem for secure machining of grommets.
 5. Bottom Hem: To be 1-1/2 inches wide double thickness double lock stitched.
 6. Side Hem: To be ½ inch wide turned and single lock stitched.
- B. Vertical Seams: Not less than ½ inch wide, double turned and double stitched.

2.4 IV SUPPORT SYSTEM

- A. Basis of Design Manufacturer: IV track shall be model IFC-100, as manufactured by Imperial Privacy Systems LLC, or approved equal.
- B. Extruded-Aluminum IV Track: IV track shall be extruded of 6063-T5 aluminum, 1-9/16 inches wide by 15/16 inch high; with minimum wall thickness of .075 inch.
 1. Curved Track: Factory fabricated 12 inch radius bends.
 2. Finish: Satin anodized or electrostatic white paint.
- C. IV Carrier: IFC-1007, locking roller carrier with four nylon wheels, stainless-steel axles and ¼ inch diameter stainless-steel hanger loop.
- D. IV Bottle Holder: IFC-4000 (or IFC-4001 for ceiling heights over 8'6") four bottle capacity with adjustable stainless steel rod and stainless steel ram horns.
 1. Adjustment Control: Push Button.
 2. Options:
 - a. Add an additional hook to bottom of handle.
 - b. IFC-3008 eight bottle capacity holder.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with installer present, for compliance with requirements for installation tolerance, and other conditions affecting performance of work.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install tracks level and plumb . according to manufacturer's written instructions.
 1. Curtain Track Mounting: Surface.
 2. IV Track Mounting: Surface.

- B. Track Accessories: Install splices, end caps, connectors, end stops, snap outs, and other accessories as required for a secure and operational installation.
- C. Curtain Carrier: Provide curtain carrier adequate for 6 inch spacing along full length of curtain.
- D. Curtains: Hang curtains on each curtain track. Secure with curtain tieback.
- E. IV Hangers: Unless otherwise indicated, install one IV carrier and one IV bottle holder on each track.

END OF SECTION 102123

SECTION 102125 – CUBICLE TRACKING SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section includes the following:
 - 1. Curtain track and curtain carriers
 - 2. Cubicle Curtains
 - 3. IV track and bottle holders
- B. Related Sections: The following Sections contain construction relating to this Section, or require coordination with this Section:
 - 1. Section 095113 – ACOUSTICAL PANEL CEILINGS.
- C. Reference Standards
 - 1. National Fire Protection Association (NFPA):
 - a. **NFPA 701** – Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

1.3 PERFORMANCE REQUIREMENTS

- A. Curtains: Provide curtain fabric with the following characteristics:
 - 1. Fabrics are flame resistant and are identical to those that have passed NFPA 701 when tested by a testing and inspecting agency acceptable to Authorities Having Jurisdiction (AHJ).
 - a. Identify fabrics with appropriate markings of applicable testing and inspecting agency.

1.4 SUBMITTALS

- A. Product Data: Include durability, laundry temperature limit, fade resistance, and fire test response characteristics for each type of curtain fabric indicated.
- B. Shop Drawings: Show layouts and types of cubicles, size of curtains, number of carriers, anchorage details, and conditions requiring accessories. Indicate dimensions taken from field measurements.
- C. Samples for Initial Selection: For each type of curtain material, track, and curtain carriers specified.

- D. Samples for Verification: For each type of product required. Samples of size indicated below.
1. Curtain Fabric: 12 inches square swatch. Mark top and face material.
 2. Mesh Top: Not less than 4 inches.
 3. Curtain Track: 12 inches long with typical curtain carrier.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install cubicles until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at levels indicated for project when occupied for its intended use.

PART 2 – PRODUCTS

2.1 CURTAIN TRACKS

- A. Basis of Design Manufacturer: Cubicle curtain track shall be Model IFC-98, as manufactured by Imperial Privacy Systems LLC, 1400 SW 8th Street, Pompano Beach, Florida 33069; (954) 782-7130; www.imperialprivacy.com.
- B. Extruded Aluminum Track: Cubicle track shall be extruded 6063-T5 aluminum, 1 3/8” by 3/4”, 0.058” wall thickness, one piece, and surface mounted.
1. Curved track: Factory-fabricated, 12 inch radius bends.
 2. Finishes: Satin anodized or electrostatic white paint finish.
- C. Track Accessories: Fabricate splices from same material and with same finish as track.
1. End Stop: Fast-Cap no drill track end cap.
- D. Curtain Carriers: IFC-100 carriers two wheel nylon roller with steel bead chain and hard aluminum hook, 2.2 per foot.

2.2 CURTAINS

- A. Basis of Design Manufacturer: Subject to compliance with requirements, provide products by following:
1. Fabric Manufacturer: Imperial Privacy Systems LLC.
 2. Pattern Name: RX-2014 Mountain.
- B. Curtain Grommets: Two-piece, rolled-edge, rustproof aluminum, spaced not more than 6 inches o.c.; machined into top hem.
- C. Mesh Top: No. 50, 20” Wide, 1/2” Hole flame resistant white nylon mesh.
- D. Curtain Tieback: Flame resistant, woven strap with self adhesive aluminum wall plate.

- E. Baton: 3/8 inch diameter fiberglass shaft with hook.

2.3 CURTAIN FABRICATION

- A. Fabricate curtains to comply with the following requirements:
 - 1. Width equal to track length from which curtain is hung plus 10 percent added fullness, but not less than 12 inches added fullness.
 - 2. Length equal to floor-to-ceiling height minus 20 inches from finished ceiling at top, and minus distance above the finished floor at bottom as follows:
 - a. Cubicle Curtains: 15 inches.
 - 3. Top Hem: To be 1-1/2 inches wide triple thickness, and double locked stitched.
 - 4. Mesh Top: To be No. 50, 20" Wide, 1/2" Hole double lock stitched to top of curtain fabric, with a 1/2 wide triple thick top seam. Mesh to have a 1-1/4 inch 100% flame resistant polyester tape double lock stitched into top hem for secure machining of grommets.
 - 5. Bottom Hem: To be 1-1/2 inches wide double thickness double lock stitched.
 - 6. Side Hem: To be 1/2 inch wide turned and single lock stitched.
- B. Vertical Seams: Not less than 1/2 inch wide, double turned and double stitched.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with installer present, for compliance with requirements for installation tolerance, and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install tracks level and plumb according to manufacturer's written instructions.
 - 1. Curtain Track Mounting: Surface.
- B. Track Accessories: Install splices, end caps, connectors, end stops, snap outs, and other accessories as required for a secure and operational installation.
- C. Curtain Carrier: Provide curtain carrier adequate for 6 inch spacing along full length of curtain.
- D. Curtains: Hang curtains on each curtain track. Secure with curtain tieback.

END OF SECTION 102125

SECTION 102600 – IMPACT RESISTANT HANDRAILS

PART 1 – GENERAL

1.1 SUMMARY

- A. Non-PVC Handrail systems for pedestrian safety and wall protection. Furnish and install in locations as shown on the Drawings.
- B. Related Sections: The following Sections contain construction related to this Section, or require coordination with this Section:
 - 1. Section 061000 – ROUGH CARPENTRY: Wall blocking.
 - 2. Section 092900 – GYPSUM BOARD: Wall partition construction.
 - 3. Section 099110 – PAINTING: Wall finish.

1.2 SECTION INCLUDES

- A. G2-910V Round Handrail Systems by INPRO Corporation.

1.3 REFERENCE STANDARDS

- A. Americans with Disabilities Act (ADA).
- B. American National Standards Institute (ANSI).
- C. American Society for Testing and Materials (ASTM):
 - 1. **ASTM D256** – Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
 - 2. **ASTM D543** – Standard Practice for Evaluating the Resistance of Plastics to Chemical Reagents.
 - 3. **ASTM E84** – Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 4. **ASTM G21** – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
 - 5. **ASTM G22** – Standard Practice for Determining Resistance of Plastics to Bacteria (Withdrawn 2002).
- D. International Commission on Illumination (CIE):
 - 1. CIE LAB.
 - 2. CIE CMC.
 - 3. CIELCh.
- E. SAE International (SAE):
 - 1. **SAE J-1545 (Delta E)** – Instrumental Color Difference Measurement for Exterior Finishes, Textiles, and Colored Trim.

1.4 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide handrail systems that conform to the following requirements of regulatory agencies and the quality control of IPC Door and Wall Protection Systems, Inpro Corporation.
 - 1. Fire Performance Characteristics: Provide handrail conforming with the NFPA Class A fire rating. Surface burning characteristics, as determined by ASTM E-84, shall be flame spread of 25 or less and smoke development of 450 or less.
 - 2. Impact Strength: Provide profile materials that have been tested in accordance with the applicable provisions of ASTM D-256, Impact Resistance of Plastics.
 - 3. Chemical and Stain Resistance: Provide material that shows resistance to stain when tested in accordance with applicable provisions of ASTM D-543.
 - 4. Fungal and Bacterial Resistance: Provide material that does not support fungal or bacterial growth as tested in accordance with ASTM G-21 and ASTM G-22.
 - 5. GREENGUARD Certified: Provide GREENGUARD Certified profiles. Profiles shall meet the requirements of GREENGUARD Certification Standards for Low-Emitting Products and GREENGUARD Product Emission Standard for Children & Schools.
 - 6. Color Consistency: Provide components matched in accordance with SAE J-1545 - (Delta E) with a color difference no greater than 1.0 units using CIE Lab, CIE CMC, CIE LCh, Hunter Lab or similar color space scale systems.
 - 7. Code Compliance: Provide handrails that comply with all current ANSI and ADA requirements.

1.5 SUBMITTALS

- A. Product Data: Manufacturer's printed product data for each product indicated in this section.
- B. Detail Drawings: Mounting details with the appropriate fasteners for specific project substrates.
- C. Samples: Verification samples of handrail, 8" (203mm) long, in full size profiles of each type and color indicated.
- D. Manufacturer's Installation Instructions: Printed installation instructions for each handrail.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in unopened factory packaging to the jobsite.
- B. Inspect materials at delivery to assure that specified products have been received.
- C. Store in original packaging in a climate controlled location away from direct sunlight.

1.7 PROJECT CONDITIONS

- A. Environmental Requirements: Install products in an interior climate controlled environment.

1.8 WARRANTY

- A. Standard IPC Limited Lifetime Warranty against material and manufacturing defects.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Basis-Of-Design Product: Inpro Corporation, IPC Door and Wall Protection Systems
PO Box 406 Muskego, WI 53150 USA; Telephone: 800.222.5556, Fax: 888.715.8407,
Website: www.inprocorp.com.
- B. Provide Specified Product. Owner will not consider substitution requests.

2.2 MANUFACTURED HANDRAIL UNITS

- A. Basis of Design: Inpro® G2-910V Round Handrail, 1-1/2-inch (38mm) round gripping diameter, solid color, with standard molded returns and corners with reveals. Handrail extends 3-inches (76mm) from wall.
 - 1. 1-1/2" (38mm) round gripping diameter, extends 3" (76mm) from wall. Handrail shall be a solid color. Returns and corners include reveals. - G2-910V Round Handrail
 - a. Molded returns and corners standard.

2.3 MATERIALS

- A. G2 BioBlend™, a blend of PETG and biopolymer: Snap on cover of .080" (2mm) thickness shall be extruded from chemical and stain resistant G2 BioBlend™.
- B. Aluminum: Continuous aluminum retainer of .080" (2mm) thickness shall be fabricated from 6063-T5 aluminum with a mill finish.

2.4 COMPONENTS

- A. Returns, inside corners, outside corners and brackets shall be made of injection molded thermoplastics.
- B. Molded reveals shall have a smooth finish and shall be black.
- C. Fasteners: All mounting system accessories appropriate for substrates indicated on the Drawing shall be provided.

2.5 FINISHES

- A. Handrail Covers: Handrail colors to be selected by Architect from standard IPC finish selections.

- B. Molded components: Inside corners, outside corners and brackets shall be of a color matching the handrails. Surface shall have a pebblette texture.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions in which the handrail system will be installed.
 - 1. Complete all finishing operations, including painting, before beginning installation of handrail system materials.
 - 2. Wall surface shall be dry and free from dirt, grease and loose paint.

3.2 PREPARATION

- A. Surface Prep: Prior to installation, clean the substrate to remove dust, debris and loose particles. Ensure the substrate is sound and per project plans.
- B. Acclimate product in temperatures between 65°F and 80°F [18°-27°C] and a humidity level less than 80% 24 hours in advance of installation.
- C. The area of installation must temperature and humidity controlled for at least 48 hours after installation.

3.3 INSTALLATION

- A. General: Locate handrail as indicated on approved shop drawing for the appropriate substrate and in compliance with the IPC installation instructions. Install handrail level and plumb at the height indicated on the Drawings.

3.4 CLEANING

- A. At completion of the installation, clean surfaces in accordance with written IPC clean-up and maintenance instructions.

END OF SECTION 102600

SECTION 102613 – IMPACT RESISTANT CORNER GUARDS

PART 1 – GENERAL

1.1 SUMMARY

- A. Corner guard system for wall protection. Furnish and install in locations as shown on the Drawings.
- B. Related Sections. The following Sections contain construction related to this Section, or require coordination with this Section:
 - 1. Section 092900 – GYPSUM BOARD: Wall partition construction.
 - 2. Section 099110 – PAINTING: Wall finish.

1.2 SECTION INCLUDES

- A. 160 High Impact Surface Mount Corner Guard System by Inpro Corporation.

1.3 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. **ASTM D256** – Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
 - 2. **ASTM D543** – Standard Practice for Evaluating the Resistance of Plastics to Chemical Reagents.
 - 3. **ASTM D635** – Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
 - 4. **ASTM E84** – Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 5. **ASTM G21** – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
 - 6. **ASTM G22** – Standard Practice for Determining Resistance of Plastics to Bacteria (Withdrawn 2022).
- B. International Commission on Illumination (CIE):
 - 1. CIE LAB.
 - 2. CIE CMC.
 - 3. CIE LCh.
- C. SAE International (SAE):
 - 1. **SAE J-1545 (Delta E)** – Instrumental Color Difference Measurement for Exterior Finishes, Textiles, and Color Trim.
- D. Uniform Building Code (UBC).
- E. Underwriters Laboratories (UL):

1. **UL 723** – Test for Surface Burning Characteristics of Building Materials.

1.4 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide corner guard system that conform to the following requirements of regulatory agencies and the quality control of IPC Door and Wall Protection Systems, Inpro Corporation.
 1. Fire Performance Characteristics: Provide UL Classified corner guards conforming with NFPA Class A fire rating. Surface burning characteristics, as determined by UL-723 (ASTM E-84), shall be flame spread of 10 and smoke development of 350 - 450.
 2. Self-Extinguishing: Provide corner guards with a CC1 classification, as tested in accordance with the procedures specified in ASTM D-635-74, Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position, as referenced in UBC 52-4-1988.
 3. Impact Strength: Provide rigid vinyl profile materials that have an Impact Strength of 30.2 ft-lbs/inch of thickness as tested in accordance with the procedures specified in ASTM D-256-90b, Impact Resistance of Plastics.
 4. Chemical and Stain Resistance: Provide corner guards that show resistance to stain when tested in accordance with applicable provisions of ASTM D-543.
 5. GREENGUARD Certified: Provide GREENGUARD Certified material. Profiles shall meet the requirements of GREENGUARD Certification Standards for Low-Emitting Products and GREENGUARD Product Emission Standard for Children & Schools.
 6. Fungal and Bacterial Resistance: Provide rigid vinyl that does not support fungal or bacterial growth as tested in accordance with ASTM G-21 and ASTM G-22.
 7. Color Consistency: Provide components matched in accordance with SAE J-1545 - (Delta E) with a color difference no greater than 1.0 units using CIE Lab, CIE CMC, CIE LCh, Hunter Lab or similar color space scale systems.

1.5 SUBMITTALS

- A. Product Data: Manufacturer's printed product data for each type of corner guard specified.
- B. Detail Drawings: Mounting details with the appropriate adhesives for specific project substrates.
- C. Samples: Verification samples of corner guard, 8" (203mm) long, in full size profiles of each type and color indicated.
- D. Manufacturer's Installation Instruction: Printed installation instructions for each corner guard.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in unopened factory packaging to the jobsite
- B. Inspect materials at delivery to assure that specified products have been received.

- C. Store in original packaging in a climate controlled location away from direct sunlight.

1.7 PROJECT CONDITIONS

- A. Environmental Requirements: Products must be installed in an interior climate controlled environment.

1.8 WARRANTY

- A. Standard IPC Limited Lifetime Warranty against material and manufacturing defects.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Basis-Of-Design Product: Inpro Corporation, IPC Door and Wall Protection Systems PO Box 406 Muskego, WI 53150 USA; Telephone: 800.222.5556, Fax: 888.715.8407, Website: www.inprocorp.com.

- 1. Provide specified product; Owner will not consider substitution requests.

2.2 MANUFACTURED CORNER GUARD UNITS

- A. Basis of Design Corner Guard System:

- 1. Inpro®160 - High Impact Corner Guard Profile.
 - a. 2" (51mm) x 2" (51mm), 90 degree.
 - b. 4 ft. (1.22m) standard height.

2.3 MATERIALS

- A. Vinyl: Snap on cover of .080" (2mm) thickness shall be made 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).
- B. Aluminum: Continuous aluminum retainer of .070" (1.8mm) thickness shall be fabricated from 6063-T5 aluminum, with a mill finish.

2.4 COMPONENTS

- A. Top caps and bottom caps shall be made of injection molded thermoplastics.
- B. Fasteners: All mounting system accessories appropriate for substrates indicated on the drawings shall be provided.

2.5 FINISHES

- A. Vinyl Covers: Colors of the corner guard to be selected by Architect from IPC Standard finish selections. Surface shall have a pebblette texture.

- B. Molded Components: Top caps and bottom caps shall be of a color matching the corner guards. Surface shall have a pebblette texture.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions in which the corner guard systems will be installed.
 - 1. Complete all finishing operations, including painting, before beginning installation of corner guard system materials.
- B. Wall surface shall be dry and free from dirt, grease and loose paint.

3.2 PREPARATION

- A. Surface Prep: Prior to installation, clean the substrate to remove dust, debris and loose particles. Ensure the substrate is sound and per project plans.
- B. Acclimate product in temperatures between 65°F and 80°F [18°-27°C] and a humidity level less than 80% 24 hours in advance of installation.
- C. The area of installation must temperature and humidity controlled for at least 48 hours after installation.

3.3 INSTALLATION

- A. General: Locate corner guard as indicated on approved shop drawings for the appropriate substrate and in compliance with IPC installation instructions. Install corner guard level and plumb at the height indicated on Drawings.
- B. Installation of 160 High Impact Surface Mount Corner Guard:
 - 1. Position the aluminum retainer against the wall, allowing 5/16" (8mm) from the bottom of the aluminum to the top of the cove base or baseboard for the bottom cap.
 - 2. Aluminum Retainer Installation
 - a. Drywall installation: Secure the aluminum retainer to the wall using 1-1/4" phillips round head self-tapping screws. Use 6 screws per 4' (1.22m) length, 10 screws per 8' (2.44m) length, or 12 screws per 9' (2.74m) length. The aluminum retainer is pre-slotted to aid in the installation.
 - 3. Top and Bottom Cap Installation
 - a. Drywall installation: Overlap the aluminum with the mounting tabs of the top cap and attach them to the aluminum retainer using two, 1-3/4" phillips flat head self tapping screws per cap.

4. Position the vinyl cover on the aluminum retainer to check the fit. Adjust the top cap on the aluminum retainer to obtain a tight fit with the vinyl cover. Starting at the top, push the vinyl cover over the aluminum, by pressing over the length until the vinyl snaps securely into place.

3.4 CLEANING

- A. At completion of the installation, clean surfaces in accordance with the IPC clean-up and maintenance instructions.

END OF SECTION 102613

SECTION 102800 - TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submittals: Manufacturer's product data for each toilet accessory item specified, including details of construction relative to materials, dimensions, gages, profiles, mounting methods, specified options, and finishes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Basis of Design: Subject to compliance with requirements, provide toilet accessories by:
 - 1. American Specialties, Inc. (ASI).
 - 2. Koala Kare.
 - 3. Bobrick.
 - 4. Bradley.
 - 5. Or approved equivalent.
- B. Provide toilet accessories as shown on the Drawings. Refer to Sheet A402 – MILLWORK & INTERIOR ELEVATIONS.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation: Install toilet accessory units according to manufacturers' printed installation instructions, using fasteners appropriate to substrate as recommended by unit manufacturer. Install units plumb and level, firmly anchored in locations and at heights indicated.
 - 1. Secure mirrors to walls in concealed, tamperproof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, in accordance with manufacturer's instructions for type of substrate involved.
 - 2. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
 - 3. Clean and polish all exposed surfaces strictly according to manufacturer's recommendations after removing temporary labels and protective coatings.

END OF SECTION 102800

SECTION 104416 - FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submittals: Submit the following:
 - 1. Product Data: Include rough-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style, door construction, panel style, and materials.
- B. Coordination: Verify that cabinets are sized to accommodate type and capacity of extinguishers indicated.

1.2 PRODUCT REQUIREMENTS

- A. UL-Listed Products: Fire extinguishers shall be Underwriters Laboratories (UL) listed with UL listing mark for type, rating, and classification of extinguisher.
- B. FM-Listed Products: Fire extinguishers approved by Factory Mutual (FM) Research Corporation for type, rating, and classification of extinguisher with FM marking.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: J.L. Industries / ACTIVAR Construction Products Group, Inc. Bloomington, MS 55431, (800) 554-6077, www.activarcpg.com.

2.1 PRODUCTS

- A. Fire Extinguisher Cabinet (F.E.C.)
 - 1. Basis of Design: Fire Extinguisher Cabinet shall be Ambassador Series 1013V10 with painted white door & trim, vertical duo gray acrylic glazing, with recessed pull, fully or semi recessed (as wall depth will allow), or approved equivalent. Refer to the Drawings for locations.
- B. Fire Extinguisher Bracket (F.E.B.)
 - 1. Basis of Design: Fire Extinguisher Bracket shall be #MB-846, or approved equivalent. Refer to the Drawings for locations requiring wall brackets.
- C. Fire Extinguishers
 - 1. Fire Extinguisher No. 1: Basis of Design: Cosmic Multi-Purpose Dry Chemical, Model 10E, 10 pound, UL Rated 4A-80BC, or approved equivalent. Install in each fire extinguisher cabinet and at each fire extinguisher bracket in locations as shown on the Drawings

2. Fire Extinguisher No. 2: Basis of Design: Sentinel Carbon Dioxide, Model 10, 10 pounds, UL Rated 10BC, or approved equivalent. Install in locations as indicated on the Drawings using wall bracket #MB810C, or approved equivalent.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation: Follow manufacturer's printed instructions.
- B. Install at heights indicated (not to exceed 4'-0" to top of extinguisher) or if not indicated, at heights to comply with applicable regulations of governing authorities.
 1. Prepare wall recesses for cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
 2. Fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb.

END OF SECTION 104416

SECTION 105113 - METAL LOCKERS

PART 1 - GENERAL

1.1 GENERAL

- A. The Owner shall purchase and install all locking hardware for use with lockers specified in this section.

1.2 SUBMITTALS

- A. Submittals: In addition to product data, submit the following:
 - 1. Shop drawings of metal locker layouts, elevations, dimensions, details, and accessories; locker numbering sequence; and installation and anchorage requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design Manufacturer: Subject to compliance with requirements, provide products by the following:
 - 1. Republic Storage Products, LLC, Canton, Ohio, or approved equivalent.
- B. Furnish and install lockers in locations as shown on the Drawings.

2.2 LOCKERS

- A. Basis of Design: "Single Point II" Series, standard construction.
- B. Size:
 - 1. Break Room 423: Six (6), 2-tier units, 12" wide X 15" deep X 36" high.
 - 2. Total Number of Lockers: 12

2.3 ACCESSORIES

- A. Locker Accessories: Provide as required and as follows:
 - 1. Number Plates: Manufacturer's standard nonferrous-metal number plates fastened to each locker door.
 - 2. Continuous Metal Base: 0.0598-inch- (1.5-mm-) (16 gauge) thick minimum Zee steel sheet. 4" high, lengths as long as practical with reinforced hairline joints. Finish to match lockers.
 - 3. Filler Panels: 0.0478-inch (1.2-mm) (18 gauge) minimum steel sheet, factory fabricated. Finish to match lockers.

4. Finished End Panels: Manufacturer's standard 0.0239-inch (0.61-mm) (24 gauge) minimum steel sheet end-finishing panels to conceal exposed ends of nonrecessed lockers. Finish to match lockers.

2.4 FABRICATION AND FINISHES

- A. Fabrication: Fabricate lockers from mild cold rolled steel square, rigid, and without warp, with metal faces flat and free of dents or distortion. Make exposed metal edges free of sharp edges and burrs, and safe to touch. Rivet or bolt frame members together to form a rigid, 1-piece structure.
- B. Baked-Enamel Finish: Solvent-clean, phosphatize-pretreat, and apply manufacturer's standard baked-enamel finish consisting of a thermosetting topcoat in color selected by Architect from manufacturer's twenty-five (25) standard colors.
- C. Construction: Pre-assembled, standard construction in multiple groups conforming to job requirements. Nuts, bolts, or rivets shall be allowed in assembly of main locker groups.
- D. Door Frames: 16 gauge formed into 1 inch wide face channel shape. Continuous vertical door strike integral with frame on both sides of door opening. Six tier locker cross frame members shall be 16 gauge channel shape securely welded to vertical framing members to ensure square and rigid assembly.
- E. Doors: Single piece 14 gauge outer door with double return flanges on both vertical edges and a single return flange on top and bottom edges. Tiered locker doors shall have full height 16 gauge channel reinforcement. Ventilation shall consist of full perimeter opening plus Verti-vent slots in the top and bottom face of the doors. Punched number plate mounting shall be at the top of the door.
- F. Latching: An 11 gauge frame hook shall be secured to the locker side frame located midway up on the door. Frame hook shall have a padlock hasp protruding through a stainless steel recessed pocket and will also have punching to accept Master Lock 1690 (combination) or 1790 (keyed) locks. Note: locking devices are to be Owner furnished and installed.
- G. Handles: One-piece, deep drawn stainless steel cup, securely riveted to door to form a recessed receptacle for a padlock or built-in lock. Pocket shall have a formation across the top serving as a door pull.
- H. Hinges: 2 inches high, 5-knuckle, full loop, tight pin style, securely welded to frame and double riveted to inside of the door flange. Doors 42 inches high and less shall have two hinges.
- I. Body: Uprights fabricated from 16 gauge steel. Locker back fabricated from 16 gauge cold rolled steel formed in combination with the uprights to provide a one-piece uniform structure. Tops, bottoms, shelves, and compartment dividers shall be 16 gauge steel, fully flanged on all sides for added stiffness. Shelves shall have an additional front edge return flange creating a channel shape to strengthen the impact surface. All body parts shall be finished in the same color as the doors and frames.

- J. Interior Equipment: Single tier lockers over 42 inches high shall have one hat/book shelf. No shelves on other tiered lockers. Single, double, and triple tier lockers shall have one double prong rear hook and two single prong side hooks in each compartment. No hooks on locker openings under 20 inches high. Hooks shall be made of steel, formed with ball points, zinc-plated, and attached with two bolts or rivets.
- K. Number Plates: Each locker shall have a polished aluminum number plate with black numerals not less than ½ inch high, and attached with rivets to the top face of the locker door for high visibility.
- L. Assembly: Locker groups shall be attached to each other using zinc plated, low round head, slot less, fin neck machine screws with Keps nuts to produce a strong mechanical connection.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install metal lockers complete with accessories according to manufacturer's recommendations. Install plumb, level, rigid, and flush with no exposed fasteners on door faces and face frames.
- B. Anchor lockers to floors and walls at intervals recommended by manufacturer but no greater than 36 inches (910 mm) on center.
- C. Caulk all gaps at locker to wall locations for infection control.

END OF SECTION 105113

SECTION 114610 - OWNER FURNISHED AND INSTALLED ITEMS

PART 1 - GENERAL

1.1 SCOPE: Furnish and install material and labor necessary for general rough-in of electrical, mechanical and plumbing work associated with the installation of equipment, fixtures and accessories as shown on the Drawings to be Owner furnished (OF) and Owner installed (OI) under separate Contracts as listed below:

A. Medical Equipment/Miscellaneous Equipment:

1. Medical Containers.
2. Trash Cans.
3. Hand Sanitizers.
4. Linen Carts.
5. Clocks.
6. Shelving.
7. Wall-Mounted Televisions.
8. Counter-mounted Ice Makers.
9. Infusion Chairs, Infusion TV Monitors, & Wall-mounted Monitor Arms.
10. Microwaves.
11. Office Equipment.
12. Furnishings.
13. Refrigerator/Freezer.
14. CT Machine.
15. CT Power Distribution Unit.
16. CT Computer Console, Monitor, & Keyboard.
17. Pharmacy Hood.
18. Undercounter Refrigerators.
19. Blanket Warmers.
20. Undercounter Freezers.
21. Centrifuge (Counter-mounted).
22. Printers.
23. Small Paper Towel & Soap Dispensers.
24. Lectern.
25. Any other items mutually agreed upon per the Contract between Owner and Contractor that are not specifically listed.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 114610

SECTION 114620 – OWNER FURNISHED – CONTRACTOR INSTALLED ITEMS

PART 1 - GENERAL

1.1 SCOPE: Furnish and install material and labor necessary for general construction and rough-in of electrical, mechanical and plumbing work associated with the installation of equipment, fixtures and accessories to be Owner furnished (OF) and Contractor installed (CI) as listed below:

A. Miscellaneous Equipment:

1. Soap Dispensers.
2. Towel Dispensers.
3. Large Format Televisions and TV Wall Mount Brackets.
4. Any other items mutually agreed upon per the Contract between Owner and Contractor that are not specifically listed.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 114620

SECTION 122413 - ROLLER SHADES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Motorized blackout and sunscreen double roller shades with wireless controls in locations as shown in the drawings.

1.2 RELATED SECTIONS & DIVISIONS

- A. Section 061000 - ROUGH CARPENTRY: Wood blocking and grounds for mounting roller shades and accessories.
- B. Section 092900 - GYPSUM BOARD: Coordination with gypsum board assemblies for installation of shade pockets, closures and related accessories.
- C. Section 095123 - ACOUSTICAL TILE CEILINGS: Coordination with acoustical ceiling systems for installation of shade pockets, closures and related accessories.
- D. Division 26 - Electrical: Electric service for power, wiring, and wireless controls.

1.3 REFERENCES

- A. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. NFPA 70 - National Electrical Code.
- C. NFPA 701 - Fire Tests for Flame-Resistant Textiles and Films.

1.4 SUBMITTALS

- A. Submit under provisions of Section 013000 – SUBMITTAL PROCEDURES. Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
 - 3. Storage and handling requirements and recommendations.
 - 4. Mounting details and installation methods.
 - 5. Typical wiring diagrams including integration of wireless motor controllers with building management system, audiovisual and lighting control systems if applicable.
- B. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work.
- C. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings and include opening sizes and key to typical mounting details.

- D. Selection Samples: For each finish product specified, one set of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shadecloth sample and aluminum finish sample as selected. Mark face of material to indicate interior faces.
- F. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.
- B. Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.
- C. Fire-Test-Response Characteristics: Passes NFPA 701 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.
- D. Electrical Components: NFPA Article 100 listed and labeled by either UL or ETL or other testing agency acceptable to authorities having jurisdiction, marked for intended use, and tested as a system. Individual testing of components will not be acceptable in lieu of system testing.
- E. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in the Window Treatment Schedule.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.8 WARRANTY

- A. Roller Shade Hardware and Chain Warranty: Manufacturer's standard non-depreciating ten-year for hardware and twenty-five year limited warranty.
- B. Electro Shade Standard Shadecloth: Manufacturer's standard twenty-five year warranty.
- C. Roller Shade Motors and Motor Control Systems: Manufacturer's standard non-depreciating ten-year warranty.
- D. Roller Shade Installation: One year from date of Substantial Completion, not including scaffolding, lifts or other means to reach inaccessible areas.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Manufacturer: Mecho, which is located at: 42-03 35th St.; Long Island City, NY 11101; Tel: 718-729-2020; Fax: 718-729-2941; Email:marketing@mechoshade.com; Web:http://www.mechoshade.com
- B. Local Supplier/Installer: Arkansas Shades, Blinds, and Shutters, 3704 Phyllis Court, North Little Rock, Arkansas 72118; Work: 501-812-4858.
- C. Requests for substitutions will be considered in accordance with provisions of Section 016000 - PRODUCT REQUIREMENTS and Section 012500 – SUBSTITUTION PROCEDURES.

2.2 ROLLER SHADE TYPE AND SHADECLOTH

- A. Motorized Shades:
 - 1. Mounting: Surface mounted.
 - 2. Configuration: Single solar shadecloth.
 - 3. Solar Shadecloths
 - a. Fabric: Soho 1600, thin, fine, screen cloth in broad range of colors in basket weave pattern at 3 percent open.
 - b. Color: Selected from manufacturer's standard colors.
 - 4. Controls: Wireless Electrically operated, Quiet Intelligent Encoded Motor System.

2.3 SHADE BAND

- A. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem-pocket, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
 - 1. Hem Pockets and Hem Weights: Fabric hem pocket with RF-welded seams (including welded ends) and concealed hem weights. Hem weights shall be of

appropriate size and weight for shade band. Hem weight shall be continuous inside a sealed hem pocket. Hem pocket construction and hem weights shall be similar, for all shades within one room.

2. Shade Band and Shade Roller Attachment:

- a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection. Roller tubes less than 1.55 inch (39.37 mm) in diameter for manual shades, and less than 2.55 inches (64.77 mm) for motorize shades are not acceptable.
- b. Provide for positive mechanical engagement with drive / brake mechanism.
- c. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a "snap-on" "snap-off" spline mounting, without having to remove shade roller from shade brackets.
- d. Mounting spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
- e. Any method of attaching shade band to roller tube that requires the use of adhesive, adhesive tapes, staples, and/or rivets are not acceptable.

2.4 SHADE FABRICATION

- A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise. (Verify sizes and locations of all shades with existing window framing members, walls, columns, and determine layouts which minimize number of shades in any space).
- B. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shadebands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.
- C. For railroaded shadebands, provide seams in railroaded multi-width shadebands as required to meet size requirements and in accordance with seam alignment as acceptable to Architect. Seams shall be properly located. Furnish battens in place of plain seams when the width, height, or weight of the shade exceeds manufacturer's standards. In absence of such standards, assure proper use of seams or battens as required to, and assure the proper tracking of the railroaded multi-width shadebands.
- D. Provide battens for railroaded shades when width-to-height (W:H) ratios meet or exceed manufacturer's standards. In absence of manufacturer's standards, be responsible for proper use and placement of battens to assure proper tracking and roll of shadebands.

2.5 COMPONENTS

- A. Access and Material Requirements:

1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
3. Use only Delrin engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and /or polyester, or reinforced polyester will not be acceptable.

B. Motorized Shade Hardware and Shade Brackets:

1. Provide shade hardware constructed of minimum 1/8-inch (3 mm) thick plated steel, or heavier, thicker, as required to support 150 percent of the full weight of each shade.
2. 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).

2.6 SHADE MOTOR DRIVE SYSTEM

A. Shade Motors:

1. Tubular, asynchronous (non-synchronous) motors, with built-in reversible capacitor operating at 110 VAC (60 hz), single phase, temperature Class A, thermally protected, totally enclosed, maintenance free with line voltage power supply equipped with locking disconnect plug assembly furnished with each motor.
2. Conceal motors inside shade roller tube.
3. Maximum current draw for each shade motor of 2.3 amps.
4. Use motors rated at the same nominal speed for all shades in the same room.

B. Total hanging weight of shade band shall not exceed 80 percent of the rated lifting capacity of the shade motor and tube assembly.

2.7 MOTOR CONTROL SYSTEMS

A. Quiet Intelligent Encoded Motor System: Specifications and design are based on the Intelligent Motor Control System / WhisperShade-IQ Motor System) as manufactured by Mecho.

1. Quiet operation of up to 46 dBa within 3 feet (914 mm), open air.
2. Upper and lower stopping points (operating limits) of shade bands shall be programmed into motors via a hand held removable program module / configurator.
3. Intermediate stopping positions for shades shall allow for up to three repeatable and precise aligned positions.
4. Up to 103 available alignment points including 3 user programmable predefined intermediate positions, for a total of 5 defined and aligned positions. All shades on the same switch circuit with the same opening height shall align at each intermediate stopping position.

5. Uniform or Regular Modes of Operation:
 - a. Uniform mode shall allow for shades to only move to intermediate stop positions.
 - b. Regular mode shall allow for shades to move to both intermediate stop positions, plus any position desired between the upper and lower limits as set by the installer.
6. Wall Switches:
 - a. IQ-Switch: 10 button, single gang, low voltage.
 - b. Wireless Control: MechoNet Wireless Controllers.

2.8 ACCESSORIES

- A. Fascia: Provide removable aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners. Finish to be painted bronze finish at exterior shades and clear anodized for interior shades.

PART 3 - EXECUTION

3.1 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.

3.2 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.

3.3 INSTALLATION

- A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions, and located so shade band is not closer than 2 inches (51 mm) to interior face of glass. Allow proper clearances for window operation hardware.
- B. Single-Source Responsibility for Motorized Interior Roller Shades: To control the responsibility for performance of motorized roller shade systems:
 1. General Contractor shall provide power panels and circuits of sufficient size to accommodate roller shade manufacturer's requirements, as indicated on the mechanical and electrical drawings.
 2. General Contractor shall coordinate with requirements of roller shade installer/dealer, before inaccessible areas are constructed.

3. General Contractor shall run line voltage as dedicated home runs (of sufficient quantity, in sufficient capacity as required) terminating in junction boxes in locations designated by roller shade dealer.
 4. General Contractor shall provide and run all line voltage (from the terminating points) to the motor controllers, wire all roller shade motors to the motor controllers, and provide and run low voltage control wiring from motor controllers to switch/ control locations designated by the Architect. All above-ceiling and concealed wiring shall be plenum-rated, or installed in conduit, as required by the electrical code having jurisdiction.
 5. General Contractor shall provide conduit with pull wire in all areas, which might not be accessible to roller shade contractor due to building design, equipment location or schedule.
- C. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
 - D. Clean roller shade surfaces after installation, according to manufacturer's written instructions.
 - E. Engage Installer to train Owner's maintenance personnel to adjust, operate and maintain roller shade systems.

3.4 PROTECTION

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

END OF SECTION 122413

SECTION 124813 – ENTRANCE FLOOR MATS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Entrance Matting systems, including modular carpet tile entrance systems

1.2 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. **E 648** - Standard Test Method for Critical Radiant Flux of Flooring Systems using a Radiant Energy Source.
 - 2. **E 662** - Standard Test Method for Specific Density of Smoke Generated by Solid Materials.
 - 3. **D 2047** - Standard Test Method for Static Coefficient of Friction measured by the James Machine.
- B. American Association of Textile Chemists and Colors (AATCC):
 - 1. Colorfastness to Light - **AATCC 16**, Option E: Minimum rating of 4 on grey scale after 80 hours exposure.
 - 2. Colorfastness to Crocking **AATCC 165**: Minimum rating of 4 wet and dry.
 - 3. Static Resistance: carpet construction to provide a minimum of 3.0 KV resistance for 20% R. H. at 70 degrees, **AATCC 134**.
- C. The Carpet and Rug Institute (CRI).
- D. The National Floor Safety Institute (NFSI).
- E. American with Disabilities Act (ADA).
- F. International Organization for Standardization (ISO):
 - 1. **ISO 9001** – Quality Management Systems.
 - 2. **ISO 14001** – Environmental Management Systems.
- G. Occupational Health and Safety Assessment Series (OHSAS):
 - 1. **OHSAS 18001** – Requirements.

1.3 SUBMITTALS

- A. Product Data: Submit product data, including manufacturer’s specification summary sheet for specified products.
- B. Manufacturers Certifications:
 - 1. Provide manufacturer’s factory location for the specified product(s).

2. Provide ISO 9001 certification.
 3. Provide ISO 14001 certification.
 4. Provide OHSAS 18001 certification.
- C. Shop Drawings: Submit shop drawings showing layout, seaming diagram, finish colors, designs and textures.
- D. Samples: Submit 6” selection and verification samples for finishes, colors, designs and textures.
- E. Quality Assurance Submittals: Submit the following:
1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- F. Submit the following:
1. Maintenance Data: Maintenance data for installed products in accordance with Division 1 sections. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
 2. Warranty: Provide manufacturer’s written warranty.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
1. ISO 9001 Certified.
 2. ISO 14001 Certified.
 3. OHSAS 18001 Certified.
 4. At least ten years’ active experience in the manufacture and marketing of commercial flooring.
- B. Installer Qualifications:
1. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installing work similar to that required for this project.
 2. At least five years’ experience in the installation of entrance flooring.
 3. Experience on at least five projects of similar size, type and complexity of current project.
 4. Employer of tradesmen for current project who are competent in techniques required by manufacturer for entrance flooring installation indicated.
- C. Pre-Installation Meetings: Conduct pre-installing meeting to confirm project requirements, substrate conditions, manufacturer’s installation instructions and warranty requirements comply with requirements in Section 013100 – PROJECT MANAGEMENT AND COORDINATION.

1.5 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with requirements in Division 1 Sections.

- B. Ordering: Comply with manufacturer's ordering and lead-time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- D. Storage and Protection: Material shall be stored in areas that are enclosed and weather tight and at temperature recommended by manufacturer to protect from exposure to harmful weather conditions prior to commencement of installation

1.6 PROJECT CONDITIONS

- A. Environmental Requirements/Conditions: In accordance with manufacturer's recommendations, areas to receive floor covering shall be clean, fully enclosed and weather tight.
- B. The temperature of the space shall be kept at a manufacturer's recommendation continually after installation. The entrance flooring material and adhesive shall be conditioned in the same manner.

1.7 SEQUENCING AND SCHEDULING

- A. Finishing operations: Install entrance flooring after finishing operations; including painting and ceiling operations have been completed.

1.8 WARRANTY

- A. Manufacturer's Materials Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document.
- B. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
 - 1. Total Warranty Period: 5-year Wear Warranty commencing on the date of substantial completion.
 - 2. For materials: 1-Year Warranty on Manufacturing Defects from date of substantial completion.

1.9 MAINTENANCE

- A. Extra materials: Deliver to the Owner extra materials of the products to be installed. Package products with protective covering or in original cartons and identify with descriptive labels. Comply with Division 1 Closeout Submittals (maintenance materials) Section
 - 1. Quantity: Furnish quantity of floor covering material equal to 5% of the amount to be installed
 - 2. Delivery, Storage and Protection: Comply with the Owner's requirements for delivery, storage and protection of extra materials

- B. Maintenance of entrance flooring shall be according to Milliken maintenance instructions

PART 2 - PRODUCTS

2.1 COMMERCIAL MODULAR CAEPET TILE ENTRANCE SYSTEMS

- A. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide Milliken OBEX Tiles.
- B. Substitution Limitations – No Substitutions.
- C. Product Description: Modular Tile Entrance Systems:
 - 1. Tile Size: Not less than 19.69 inches (50cm).
 - 2. Textile Yarn Type: Nylon and Monofilament, Type 6 and 6,6.
 - 3. Indoor Air Quality: CRI Green Label Plus™.
 - 4. Backing: PVC-Free Polyurethane Cushion backing, available with adhesive free TractionBack backing option.
 - 5. Pattern and Color: As selected from Milliken OBEX Tile standard patterns and colors. Refer to Drawings, Sheet A701 – 4TH FLOOR FINISH PLAN.
 - a. OBEX Tile – CutX:
 - 1) Classification: Modular Tile Entrance Systems.
 - 2) Form: Modular Tile.
 - 3) Thickness: 0.50 inches (13mm).
 - 4) Tile Size: 19.69 x 19.69 inches (50cm x 50cm).
 - 5) Textile Construction: Tufted, Cut Pile.
 - 6) Textile Yarn Type: Milliken – Certified WearOn® Nylon and Monofilament Type 6,6 and 6.
 - 7) Tufted Face Weight: 24 oz/yd² (814g/m²).
 - 8) Tile Backing: PVC-Free WellBAC™ Comfort Plus Cushion (Available with TractionBack® adhesive free backing system).
 - 9) Manufacturer’s warranty period: 5-Year Wear Warranty and 1-Year Manufacturing Defect Warranty commencing on date of Substantial Completion.
 - 6. Finishing:
 - a. Wall to wall Applications: Cut to fit and install with standard pressure sensitive adhesive or with TractionBack® adhesive free backing system.

PART 3 - EXECUTION

3.1 MANUFACTURER’S INSTRUCTIONS

- A. Compliance: Comply with manufacturer’s requirements as published in Milliken published Installation Instructions.
- B. Specify Recessed or Surface Mount and length and width measurements for each application to ensure you receive correct finishing components.

3.2 EXAMINATION

- A. Site verification of conditions: Confirm substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.
- B. Material inspection: In accordance with manufacturer's installation requirements, visually inspect materials prior to installing and during installation, if visual defect is noticed STOP WORK and contact manufacturer. Material with visual defects should not be installed.
- C. Other work, including overhead work, that could cause damage, dirt, dust, debris or otherwise interrupt installation has been completed or suspended.

3.3 INSTALLING

- A. Refer to Milliken OBEX Tile installation guide for detailed specifications on installing OBEX Tiles regarding job site conditions, substrate testing and preparation, layout and installing, clean up and protection of entrance flooring after installing.
- B. Finish Entrance Flooring Designs: As selected by Architect.

3.4 CLEANING

- A. Cleaning: See Milliken OBEX Tile maintenance guide.
- B. Remove temporary coverings and protection of adjacent work areas.
- C. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.
- D. Remove construction debris from project site and legally dispose of same.

END OF SECTION 124813

SECTION 130900 - RADIATION PROTECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Radiation protection products including, but not limited to, the following:
 - 1. Lead sheets.
 - 2. Lead-laminated gypsum board.
 - 3. Lead-lined wood doors.
 - 4. Lead-lined aluminum door frames.
 - 5. Lead-lined hollow metal window frame.
 - 6. Lead glazing.
- B. Refer to letter attached at the end of this Section, dated January 21, 2025 from KLS Physics Group, LLC, for radiation shielding requirements.

1.2 RELATED SECTIONS - The following Sections contain construction related to this Section, or require coordination with this Section:

- A. Section 081250 – INTERIOR ALUMINUM DOOR FRAMES.
- B. Section 081416 – ARCHITECTURAL WOOD DOORS.
- C. Section 087100 – DOOR HARDWARE.
- D. Section 092216 – NON-STRUCTURAL METAL FRAMING.
- E. Section 092900 – GYPSUM BOARD.
- F. Section 134919 – LEAD-LINED GYPSUM BOARD.

1.3 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. **ASTM B 749** - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
 - 2. **ASTM C 1396** - Standard Specification for Gypsum Board.
- B. Federal Specifications (FS):
 - 1. **QQL-201 F Grade C** – Lead Sheet.
- C. Hollow Metal Manufacturers Association (HMMA):
 - 1. **HMMA 861** - Commercial Hollow Metal Doors and Frames.
- D. National Association of Architectural Metal Manufacturer (NAAMM).

E. National Council on Radiation Protection (NCRP):

1. Reports No. 33, No. 35 and No. 49.

F. Steel Door Institute (SDI):

1. **SDI-100** - Recommended Specifications for Standard Steel Doors and Frames.

G. Underwriter's Laboratories (UL).

1.4 DEFINITIONS

- A. Lead Equivalence: Thickness of lead that provides same attenuation (reduction of radiation passing through) as material in question under specified conditions. Lead equivalence specified for materials used in diagnostic X-Ray rooms is measured at 150 kV unless indicated otherwise.

1.5 SYSTEM DESCRIPTION

A. Design Requirements:

1. Provide materials and workmanship, including joints and fasteners, that maintain continuity of radiation protection at all points and all directions equivalent to materials specified in thicknesses and locations indicated.
 - a. Employ physicist knowledgeable in radiation protection for medical facilities to determine thicknesses and configurations of lead-lined materials.
2. Lead-Lined Assemblies: Provide lead thickness in doors, door frames, window frames, and other items located in lead-lined assemblies, not less than that indicated for assemblies in which they are installed unless indicated otherwise.
3. Lead Glazing: Provide lead equivalence not less than that indicated for assembly in which glazing is installed unless indicated otherwise.

1.6 SUBMITTALS

- A. Submit under provisions of Section 013300 – SUBMITTAL PROCEDURES.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- C. Shop Drawings:
1. Indicate dimensions, description of materials and finishes and general construction.
 2. Indicate layout of radiation-protected areas.

3. Indicate lead thickness or lead equivalencies of components.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.7 QUALITY ASSURANCE

- A. Qualifications: Firm with minimum of 5 years successful experience manufacturing radiation protection products similar to those specified for this Project.
- B. Radiation Protection Survey: Employ registered X-Ray physicist, certified by American Board of Radiology, for testing specified radiation protective Work and to conduct radiation protection survey of facility after radiation shielding materials are installed.
 1. Take radiation measurements and indicate evaluation of measurements in report. Submit report to Architect and Owner upon completion of report.
 2. Take radiation measurements in locations indicated by Architect.
- C. Radiation Protection Work: Comply with National Council of Radiation Protection (NCRP) Report No. 049 - Structural Shielding Design and Evaluation for Medical Use of X-Rays and Gamma Rays of Energies up to 10 MeV.
 1. Comply with requirements of local regulatory agencies where local standards and criteria exceed requirements of NCRP Report No. 049.
- D. Single Source Responsibility: Obtain radiation protection materials and accessories produced as standard products from single manufacturer regularly engaged in production of X-Ray shielding materials, equipment, and accessories.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's instruction for receiving, handling, storing, and protecting materials.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store materials in original packaging, protected from exposure to harmful environmental conditions, including static electricity, and at temperature and humidity conditions recommended by manufacturer.
- D. Exercise care to prevent edge damaged materials.

1.9 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 recommended limits.

1.10 WARRANTY

- A. Provide manufacturer's standard limited warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Manufacturer: Radiation Protection Products, Inc., 1000 Superior Boulevard, Suite 310, Wayzata, MN 55391. ASD. Tel: (888) 746-4777. Fax: (866) 554-8445. Email: customerservice@rppinc.com. Web: <http://www.radiationproducts.com>.
- B. Requests for substitutions will be considered in accordance with provisions of Section 012500 – SUBSTITUTION PROCEDURES and Section 016000 – PRODUCT REQUIREMENTS.

2.2 MATERIALS

- A. Lead Sheets: 99.9 percent pure unpierced virgin lead, free from dross, oxide inclusions, scale, laminations, blisters, and cracks.
 - 1. Sheet Lead shall meet or exceed the Federal Specification QQL-201 F Grade C and ASTM B 749 Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products, see NCRP reports No. 33, No. 35 and No. 49.
 - 2. Thickness: As determined by Radiation Protection Survey, or not less than 1/32 inch (0.787 mm) if not indicated.
 - 3. Variation in sheet thickness: Not to exceed 3 percent.
- B. Lead Castings/Fabrications and Lead Pigs: 99.9 percent pure virgin lead, free from dross, oxide inclusions, scale, laminations, blisters, and cracks. Fabricate as indicated on approved shop drawings.

2.3 MANUFACTURED UNITS

- A. Lead-Laminated Gypsum Board: Single unpierced layer of sheet lead laminated to back of gypsum board, ASTM C 1396/1396M; gypsum core wall panel with additives to enhance fire resistance of core and surfaced with paper on front, back, and long edges; Type X, UL rated.
 - 1. Size: 48 inch (1219 mm) wide gypsum board sheets by height indicated.
 - 2. Thickness: 5/8 inch (16 mm).
 - 3. Refer to Section 124919 – LEAD-LINED GYPSUM BOARD.
- B. Lead-Lined Wood Veneer Doors:
 - 1. Construction: Flush veneered construction using single layer of sheet lead in center of door. Laminate wood cores under hydraulic pressure on each side of lead.

- a. Extend sheet lead lining to door edges providing X-Ray absorption equal to partition in which door occurs.
 - 2. Cores: Further bond cores with 6 poured lead dowels at the following locations:
 - a. Two at 8 inches (203 mm) from top and 4 inches (102 mm) sides, 2 at center 4 inches from sides, and 2 at 8 inches (203 mm) from bottom and 4 inches (102 mm) sides.
 - 3. Edge Strips: Minimum thickness of 2 inches (51 mm) each edges of door.
 - a. Species same as wood face veneer.
 - b. Glue strips to cores before face veneer is applied.
 - c. Extend vertical edge strips full height of door and bevel 1/8 inch (3 mm) for each 2 inches (51 mm) of door thickness.
 - 4. Face Veneer: Refer to Section 081416 – ARCHITECTURAL WOOD DOORS.
- C. Lead-Lined Aluminum Door Frames: Refer to Section 081250 – INTERIOR ALUMINUM DOOR FRAMES.
- D. Radiation Shielding Leaded Glass: Clear leaded glass containing 48 percent lead oxide (by weight) and 15 percent barium. Thickness as required to provide radiation protection equivalent to that provided by sheet lead in partition in which lead glass is installed. Equivalencies based on 150 kV unless indicated otherwise.
- 1. Equivalency: 0.787 mm⁹ (1/32-Inch).
- E. Lead-Lined Hollow Metal View Window Frames: 16 gage (1.5 mm) welded steel frames adjustable from 4-1/4 inches (108 mm) to 6 inches (152 mm) wall thickness. Design window frames to accept any thickness of radiation shielding leaded glass. Design lead-lined window frames to comply with HHMA 861 and SDI-100.
- 1. Protection: Provide radiation protection equivalent to that provided by sheet lead in partition in which view window is installed.
 - 2. Stops: Provide 1/2 inch (13 mm) removable stops.

2.4 ACCESSORIES

- A. Screw Fasteners: Type S Bugle Head, length as required.
- B. Lead Strips: 2 inches (51 mm) wide, unless indicated otherwise, by same thickness as sheet lead laminated on gypsum board.
- C. Lead Angles: Leak-proof, lead angle system providing complete coverage of gamma rays used in lieu of lead strips and lead discs where sheet lead thickness is greater than 1/8 inch (3 mm) thick.
- D. Lead Discs: 3/8 inch (9.5 mm) diameter lead discs for use with screw heads.

- E. Adhesive: Acceptable to radiation protection product manufacturer and capable of adhering lead sheets where required.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine areas and conditions under which Work is to be performed and identify conditions detrimental to proper or timely completion.
- B. Verify that steel framing is not less than 20 gage (0.9 mm) with studs spaced not more than 16 inches (406 mm) on center, unless noted otherwise.
- C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF LEAD-LAMINATED GYPSUM BOARD

- A. Comply with manufacturer's recommendations.
- B. Adhere lead strips on face of studs at joints in lead-laminated gypsum board, including inside and outside corners. Use 2 inches (50 mm) wide strips by same thickness as sheet lead laminated on gypsum board.
- C. Shim studs and other framing members as necessary to provide flat, flush finished surfaces.
- D. Install lead angles per manufacturer's recommendations.
- E. Install lead-laminated gypsum board on framing with screws spaced not more than 8 inches (203 mm) on center along edges of board and 12 inches (305 mm) on center in field of board.
- F. Adhere lead discs to fastener heads. In each case, use method that provides continuous radiation shielding.
- G. Where lead-laminated gypsum board is final substrate, apply joint treatment on fasteners and joints per Section 092900 – GYPSUM BOARD.
- H. Where second layer of gypsum board occurs over lead-laminated gypsum board, comply with Section 092900 – GYPSUM BOARD for application of second layer.

3.3 INSTALLATION OF DOORS AND FRAMES

- A. Install lead-lined steel window frames 861 unless otherwise indicated. Set frames accurately in position, plumb, and braced securely until permanent anchors are set.
 - 1. Secure window frames with steel stud anchors if lead lining is below 1/8 inch (3 mm) thick.
 - 2. In metal stud construction, use wall anchors attached to studs with screws.
 - 3. Lap lead lining of frames over lining in walls at least 1 inch (25 mm).

4. Lead Lining of Frames: Line inside of frames with lead of thickness not less than that required in doors and walls in which frames are used. Form lead to match frame contour, continuous in each jamb and across head, lapping stops. Form lead shields around areas prepared to receive hardware. Lap lining over lining in walls at least 1 inch (25 mm).
- B. Install lead-lined wood veneer doors per Section 081416 – ARCHITECTURAL WOOD DOORS unless otherwise indicated. Install doors in frames level and plumb, aligned with frames and with uniform clearance at edges.
- C. Line covers, escutcheons, and plates to provide effective shielding at cutouts and penetrations of frames and doors. Refer to the Section 087100 – DOOR HARDWARE for other installations requirements.
- D. Touch up damaged finishes with compatible coating after sanding smooth.

3.4 INSTALLATION OF WINDOW FRAMES

- A. Set unleaded side of frame plumb and square in wall opening on control room side of wall with shims.
- B. Set leaded side of frame plumb and square in wall opening on X-Ray side of wall.
- C. Compress sides together against faces of wall.
- D. Install setting blocks, shims, and glazing tape in glazing channel to prevent glass from touching steel frame.
- E. Install radiation resistant glazing in telescopic frame.
- F. Place steel stops in position and mark location of stop and frame retaining holes on steel frame.
- G. Remove glazing and drill holes in steel frame.
- H. Place glazing and stops and hand drive setting screws.

3.5 INSTALLATION OF PENETRATING ITEMS

- A. At penetrations of lead linings; provide lead shields to maintain continuity of protection.
- B. Provide lead linings, sleeves, shields, and other protection in thickness not less than that required in assembly being penetrated.
- C. Cut wall penetration covers from lead sheet of equal or greater thickness than backing on adjacent wall panels. Cut wall penetration covers to size required to cover wall penetrations with laps 1 inch (25 mm) minimum wide as indicated on penetration detail drawings.

- D. Adhesive-apply lead sheet penetration covers on penetrating boxes and raceways and return penetration covers to backside of lead-backed wall panels with 1 inch (25 mm) minimum laps.
 - 1. Do not use penetrating fasteners unless indicated otherwise.
- E. Install outlet boxes and conduit between studs using steel telescoping mounting brackets. Cover or line with lead sheet lapped over adjacent lead lining at least 1 inch (25 mm). Wrap conduit with lead sheet for 10 inches (250 mm) in from box.

3.6 INSTALLATION OF WALL PENETRATION COVERS

- A. Duct Penetrations With 8 PSF or Less Lead Sheet:
 - 1. Wrap ducts with wall penetration covers, lapping lead joints 1 inch (25 mm) minimum.
 - 2. Secure lead sheet in place with 1 inch (25 mm) minimum width steel bands spaced not more than 12 inches (305 mm) on center.
 - 3. Do not cut into lead sheet with tightening steel bands.
- B. Duct Penetrations with Greater than 8 psf Lead Sheet and Where Duct Shielding Exceeds 24 Inches (610 mm) in Width:
 - 1. Laminate wall penetration covers to plywood or other similar structural panels conforming to shape of duct, lapping lead joints 1 inch (25 mm) minimum.
 - 2. Secure lead laminated panels to ducts with mechanical fasteners located at duct seams and corners.
 - 3. Where necessary to prevent lead laminated panels from overloading duct supports, independently suspend panels from hangers secured to overhead building structure.
 - 4. Cover fastener heads with lead sheet matching thickness of adjacent lead.
- C. Piping: Unless indicated otherwise, wrap piping with lead sheet for 10 inches (250 mm) from point of penetration.

3.7 ACCESSORY INSTALLATION

- A. Comply with manufacturer's recommendations.
- B. Wherever lead protection is penetrated, cut, or punctured, assure continuity of shielding by use of sheet lead, lead plugs or other approved method.
- C. Install sheet lead lining within steel window frames to provide radiation protection to levels indicated or levels required to match adjacent wall protection.
- D. Wrap electrical outlet boxes, view window frames, and other penetrations through lead barrier material with sheet lead to provide radiation protection to levels indicated or levels required to match adjacent wall protection.

3.8 FIELD QUALITY CONTROL

- A. Field Inspection: Owner will engage qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Correct deficiencies in, or remove and replace, radiation protection that inspection reports indicate does not comply with specified requirements.
- C. Testing: After radiology equipment has been installed and placed in operating condition, Owner will engage radiation health physicist to test radiation protection.
- D. Correct deficiencies in, or remove and replace, radiation protection that testing indicates does not comply with specified requirements, including finishes and other Work covering defective Work.

3.9 ADJUSTING

- A. Check and readjust operating hardware items, leaving doors and frames undamaged and in proper operating condition.

3.10 CLEANING

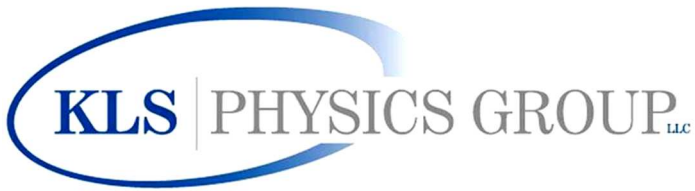
- A. Remove excess materials from site and leave Work areas broom clean.
- B. Leave exposed surfaces ready for site finishing.

3.11 PROTECTION

- A. Lock radiation-protected rooms once doors hardware is installed. Limit access to only those persons performing Work in radiation-protected rooms or as directed by Owner.
- B. Tape temporary paper signs on radiation-resistant walls with the following text:
 - 1. "Do not mount equipment on this wall without covering penetrating fasteners with lead sheet of thickness required by contract documents".

END OF SECTION 130900

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124 Killgore Rd.
Ruston, LA 71270
Telephone: (318) 255-5033
Fax: (318) 255-1189
www.klsphysics.com

January 21, 2025

Mr. Steve Grisham, AIA
Project Manager
Taggart Architects
600 Main Street, Suite 300
North Little Rock, AR 72114

Dear Mr. Grisham:

RE: Radiation shielding requirements for New CT Suite Room 425
Located at: UAMS Northeast Cancer Research Clinic – Jonesboro
311 E. Mathews Avenue, Jonesboro, AR 72401

The following are our recommendations for shielding the above referenced facility. The enclosed drawings indicate wall identifications and shielding placement.

CT Room

Wall A – Control Booth

1. Minimum recommended thickness of 1/32 inch lead lined gypsum.
2. All view windows must have, or be equivalent to the recommended shielding thickness as the wall in which they are located. Minimum equivalency of 1/32 inch lead.

Wall B – Corridor

1. Minimum recommended thickness of 1/32 inch lead lined gypsum.

Wall C – Corridor

1. Minimum recommended thickness of 1/32 inch lead lined gypsum.

Wall D – Corridor

1. Minimum recommended thickness of 1/32 inch lead lined gypsum.
2. All doors must have, or be equivalent to the recommended shielding thickness as the wall in which they are located. Minimum equivalency of 1/32 inch lead.

Wall E – Dressing Room

1. Existing 5/8" gypsum.
2. No additional shielding required.

Floor – Office

1. Existing 3 ½” standard concrete slab on 9/16” corrugated metal deck.
2. No additional shielding required.

Ceiling – Roof / Mechanical Penthouse

1. Existing 3 ½” standard concrete slab on 1 ½” 22 gauge metal deck.
2. No additional shielding required.

All shielding should extend from the floor to a minimum height of 7 feet. There should be no line-of-sight openings in the shielding barriers. All electrical boxes, conduits, etc., that are located in a wall, should be backed with the same recommended shielding thickness (or equivalent) as the wall in which they are located.

If you have any questions, please do not hesitate to call.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ashley Menard". The signature is fluid and cursive.

Ashley H. Menard, MHP
Medical Physicist

SHIELDING SUMMARY

for

New CT Suite Room 425

UAMS Northeast Cancer Research Clinic - Jonesboro


1/13/2025

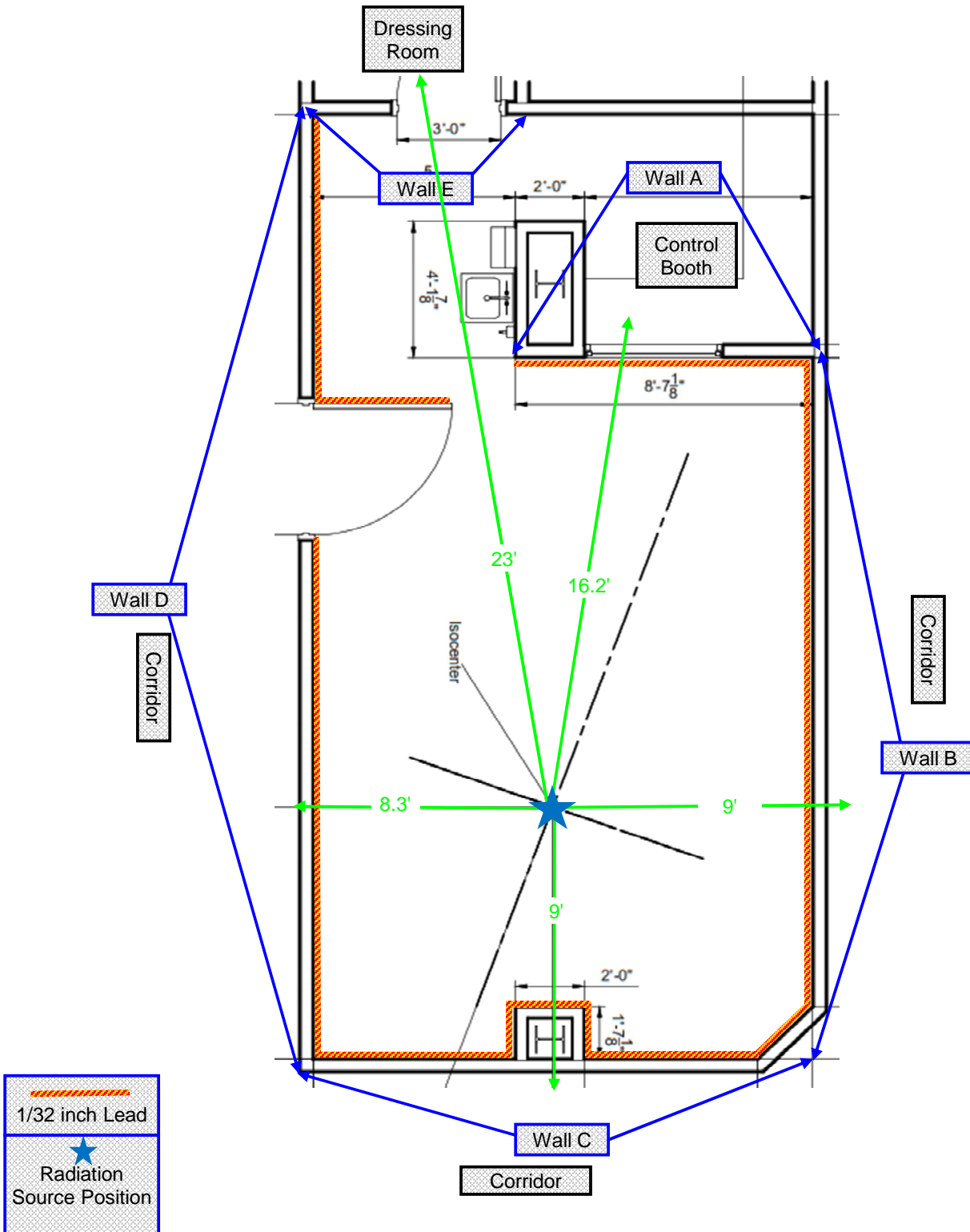
Please see attached drawing for wall identification.

Barrier ID	Conditions	Required Shielding	Recommended Shielding
Wall A - Control Booth	Controlled Area, Occupancy=1, Distance=16.2 ft	0.35 mm of Lead	1/32 inch Lead Lined Gypsum w/ Equivalent Lead Window
Wall B - Corridor	Uncontrolled Area, Occupancy=0.2, Distance=9 ft	0.67 mm of Lead	1/32 inch Lead Lined Gypsum
Wall C - Corridor	Uncontrolled Area, Occupancy=0.2, Distance=9 ft	0.67 mm of Lead	1/32 inch Lead Lined Gypsum
Wall D - Corridor	Uncontrolled Area, Occupancy=0.2, Distance=8.3 ft	0.72 mm of Lead	1/32 inch Lead Lined Gypsum w/ Equivalent Lead Door
Wall E - Dressing Room	Uncontrolled Area, Occupancy=0.025, Distance=23 ft	0 mm of Gypsum	No Additional Shielding Required (see Existing Materials below)
Floor - Office	Uncontrolled Area, Occupancy=1, Distance=10.16 ft	10.65 mm of Steel	0.42 inch Steel
Ceiling - Roof / Mechanical Penthouse	Uncontrolled Area, Occupancy=0.5, Distance=10.8 ft	84.12 mm of Concrete	3.31 inch Concrete

Existing Materials:	Floor: 3 1/2" (88.9 mm) standard concrete slab on 9/16" (14.224 mm) corrugated metal deck Roof: 3 1/2" (88.9 mm) standard concrete slab on 1 1/2" (38.1mm) 22 gauge metal deck Wall E: 5/8" gypsum board

The area will be located on the Forth Floor of a Multi-Story building. This calculation is based on a throughput of 50 patients per 40 hour work week.


 Ashley H. Menard, MHP
 Medical Physicist



CT SHIELDING CALCULATION

for

New CT Suite Room 425

UAMS Northeast Cancer Research Clinic - Jonesboro

1/13/2025

Unit Manufacturer	Unit Model	Max. kVp	Max. mA	Typical kVp	Patients per 40 Hr Week
Philips	Incisive CT	150	800	120	50

Head Technique	
<i>n CTDI 100</i>	0.223 mGy/mAs
<i>Technique mAs</i>	300 mAs
<i>Pitch</i>	1.000
<i>Scan Length</i>	20.0 cm
<i># Scans per Study</i>	1.20
<i>% Patients per Week</i>	40 %
<i>Air Kerma @ 1m</i>	1.45E-01 mGy/patient

Body Technique	
<i>n CTDI 100</i>	0.138 mGy/mAs
<i>Technique mAs</i>	250 mAs
<i>Pitch</i>	1.350
<i>Scan Length</i>	50.0 cm
<i># Scans per Study</i>	1.20
<i>% Patients per Week</i>	60 %
<i>Air Kerma @ 1m</i>	4.60E-01 mGy/patient

Barrier ID	Wall A	Wall B	Wall C	Wall D	Wall E	Floor	Ceiling			
Adjacent Area Description	Control Booth	Corridor	Corridor	Corridor	Dressing Room	Office	Roof / Mechanical Penthouse			
Adjacent Area Type	Controlled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled			
Barrier Material	Lead	Lead	Lead	Lead	Gypsum	Steel	Concrete			
Tube Distance	16.2 ft	9.0 ft	9.0 ft	8.3 ft	23.0 ft	10.2 ft	10.8 ft			
Occupancy Factor	1.000	0.200	0.200	0.200	0.025	1.000	0.500			
P/T (mGy/week)	0.100	0.100	0.100	0.100	0.800	0.020	0.040			
Barrier Trans.	1.46E-01	4.51E-02	4.51E-02	3.83E-02	2.36E+00	1.15E-02	2.60E-02			
Calculated Min. Shielding Required	0.35 mm of Lead	0.67 mm of Lead	0.67 mm of Lead	0.72 mm of Lead	0.00 mm of Gypsum	10.65 mm of Steel	84.12 mm of Concrete			
Recommended Shielding	1/32 inch Lead	1/32 inch Lead	1/32 inch Lead	1/32 inch Lead	Existing Gypsum	0.42 inch Steel	3.31 inch Concrete			

This shielding calculation was performed using **NCRP 147** guidelines.

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SECTION 134919 - LEAD-LINED GYPSUM BOARD

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. The BIDDING REQUIREMENTS, CONTRACT FORMS, and CONTRACT CONDITIONS as listed in the Table of Contents, and applicable parts of Division 1 - GENERAL REQUIREMENTS, shall be included in and made a part of this Section.
- B. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section.

1.2 SUMMARY

- A. The work of this Section consists of furnishing and installing lead-lined gypsum board where shown on the Drawings, as specified herein, and as required for a complete and proper installation. Work includes, but is not necessarily limited to the following:
 - 1. Furnish and install the following:
 - a. Lead-lined gypsum board.
 - b. Lead batten strips, ribbons, disks, and tabs as required for a complete installation.
 - 2. Daily and final cleaning of Work of this Section.

1.3 RELATED SECTIONS & DIVISIONS

- A. Section 017300 - EXECUTION: Administrative and procedure requirements for final cleaning and waste management.
- B. Section 092216 - NON-STRUCTURAL METAL FRAMING: Metal stud partition framing for lead-lined gypsum board.
- C. Section 092900 - GYPSUM BOARD:
 - 1. Application of joint treatment, edging, casings, and trim pieces.
 - 2. Taping and finishing of joints in lead-lined and standard gypsum wallboard partitions.
 - 3. Application of acoustical sealant.
- D. Section 099110 - PAINTING: Field-applied prime and finish coatings.
- E. Section 130900 – RADIATION PROTECTION.
- F. Division 26 - ELECTRICAL: Electrical boxes and receptacles.

1.4 REFERENCE STANDARDS

- A. Comply with applicable requirements of the following standards and those others referenced in this Section.
1. American Conference of Government Industrial Hygienists:
 - a. Industrial Ventilation Manual.
 2. American Society for Testing and Materials (ASTM):
 - a. **ASTM B 29** – Standard Specification for Refined Lead.
 - b. **ASTM C36** – Standard Specification for Gypsum Wallboard.
 - c. **ASTM C 1002** – Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 3. Gypsum Association (GA):
 - a. **GA 201** – Gypsum Board for Walls and Ceilings.
 - b. **GA 216** – Recommended Specifications for the Application and Finishing of Gypsum Board.
 4. International Organization for Standardization (ISO):
 - a. **ISO 9001:2008**.
 5. National Council on Radiation Protection and Measurements (NCRP):
 - a. **NCRP Report No. 147** – Structural Shielding for Medical X-Ray Imaging Facilities.
 6. U.S. Department of Labor Occupational Safety and Health Administration (OSHA):
 - a. **OSHA standard 29 CFR 1910.1025** – Lead.
 - b. **OSHA standard 29 CFR 1926** – Safety and Health Regulations for Construction.
 - c. **OSHA standard 29 CFR 1926.62** – Lead.
 7. Underwriter’s Laboratories (UL).
 8. All applicable federal, state, and municipal codes, laws, and regulations for fire-rated assemblies.

1.5 SUBMITTALS

- A. Submit the following under provisions of Section 01 33 00 - SUBMITTAL PROCEDURES:

1. Literature: Product data on lead-lined gypsum board products, performance data, physical properties, and installation instructions for each item furnished hereunder.
 - a. Include material characteristics, size limitations, and special application requirements.
 2. Certifications:
 - a. Manufacturer's written certification stating that lead-lined gypsum board systems and all related items to be furnished hereunder, meet or exceed the requirements specified under this Section and are in compliance with Physicist of Record report(s), and that the applicator is qualified and approved to install the materials in accordance with manufacturer's product data.
 - b. Installer certifications for OSHA 29 CFR 1926.
 3. Shop drawings: Manufacturer's standard design details of critical intersections within assemblies and complete installation details where gypsum board shielding will interface with work of other sections.
- B. Submit the following under provisions of Section 017700 – PROJECT CLOSEOUT.
1. Manufacturer's ISO 9001:2008 field quality control reports of field inspections, including manufacturer's final punch list.
 2. Manufacturer's warranties: Include coverage of installation for compliance with shielding requirements based on Physicist of Record report(s).

1.6 QUALITY ASSURANCE

- A. Notify the Architect where conflicts apply between referenced standards and existing materials, and existing methods of construction.
- B. Installers:
1. Installers, foreman, and job supervisors for the Work of this Section shall be trained by, and approved by, product manufacturer. Foreman and job supervisors shall be certified by manufacturer to have not less than 5 years experience in the installation of neutron / radiation shielding.
 2. All construction workers, foreman, and job supervisors for the work of this section shall have a minimum certification of 10 hours of OSHA training in occupational safety and health.

1.7 DELIVER, STORAGE AND HANDLING

- A. Do not deliver items to the site, until all specified submittals have been submitted to, and approved by, the Architect. Do not deliver items to the site, until facility is enclosed, weather-tight, and an ambient temperature above 50 degrees Fahrenheit can be maintained by General Contractor.

- B. Deliver lead-lined gypsum board on pallets, with tops and sides fully protected, and shrink- wrapped with polymer plastic film. Clearly identify brand name, identification, and address of manufacturer or supplier.
- C. General Contractor is responsible to store materials inside, under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion, and damage from construction traffic and other causes.
 - 1. Neatly stack board materials flat to prevent sagging.
 - 2. Store sheets a minimum of 3 inches above concrete floor slabs.
 - 3. Cover lead-lined gypsum board with a polyethylene vapor retarder.
- D. Handle board materials so to prevent damage to edges, ends, and surfaces.
 - 1. Avoid breaking adhesive bond between lead sheets and gypsum board.
- E. Provide protection against contamination during handling, storage, and installation procedures.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. General Contractor is fully responsible, maintain ambient temperature above 50 degrees Fahrenheit for 24 hours before, during, and 48 hours after installation of lead-lined gypsum board assemblies.

1.9 SEQUENCING AND SCHEDULING

- A. Coordinate the work of this Section with the respective trades responsible for installing interfacing work, and ensure that the work performed hereunder is acceptable to such trades for the installation of their work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Manufacturer: To establish a standard of quality, design, and function, desired drawings and specifications have been based on “Lead-Lined Gypsum” as manufactured by NELCO, 2 Burlington Woods Dr, Suite 300, Woburn, MA 01803, www.nelcoworldwide.com (telephone 800-635-2613).
 - 1. Manufacturing Facilities:
 - a. NELCO Boston: 3 Gill St - Unit D, Woburn, MA 01801
 - b. NELCO Houston: 4600 Homestead Road, Houston, TX 77028
 - c. NELCO San Francisco: 1840 Williams Street, San Leandro, CA 94577
- B. Alternative products (substitutions): Contractor must furnish appropriate and complete product data, proof of ISO 9001:2008 certification, worker OSHA certifications, environmental characteristics, and sample warranty with bid for the Architect to consider the substitutions as “equivalent” to the manufacturer, product specified and quality assurance requirements. Further additional information may be requested by the Architect

for determination that the proposed product substitution is fully equivalent to the specified products. There is no guarantee that proposed substitutions will be approved, and the Contractor is hereby directed not to order any materials until said approval(s) are received in writing.

1. Requesting substitutions is at the Contractor's own risk, with regard to uncompensated delays of the Project. Time is required for sufficient review and for additional requests of information. Delays of work which result from substitution reviews and resubmissions are not grounds for additional time or cost change orders, and will not be considered by the Owner.
2. Refer to Section 012500 – SUBSTITUTION PROCEDURES for specific requirements regarding substitutions.

2.2 MATERIALS

- A. General Sustainability Requirements: Use maximum available percentage of recycled materials but not less than that required to meet LEED™ Credit MR 5.2
 1. Gypsum Board: Gypsum board products incorporated into the work shall contain not less than 50 percent of recycled materials.
 2. Lead Backing: Lead sheet incorporated into the work shall contain not less than 90 percent of post-consumer recycled materials.
- B. Lead-lined gypsum board
 1. Basis of Design Gypsum Board: UL fire resistance rated, ASTM C 36 'Type X' board, 5/8 inch (15.9mm) thick of lengths to minimize end joints, with tapered edges, and enhanced core.
 2. Lead sheet: Conforming to ASTM B 29 in uniform thickness(es) as required by Physicist of Record report(s).
 3. Thickness: 1/32 inch [0.79mm] (nominal 2 lbs. per square foot) lead sheet to 1/8 inch [3.17mm] (nominal 8 lbs. per square foot) lead sheet.

2.3 ACCESSORIES

- A. Lead Batten Strips (Ribbon Lead): lead strips, free from any imperfections, conforming to ASTM B 29, having same thickness as lead lining on gypsum board. Provide 2 inch [50mm] wide lead strips for straight runs and 3 inch [76mm] wide lead strips at corners.
- B. Fastener Protection: The following two options are acceptable.
 1. Lead Disc to meet shielding requirements, conforming to ASTM B 29, for installation over gypsum board fastener heads.
 2. Lead Tabs to meet shielding requirements, conforming to ASTM B 29, for installation over gypsum board fastener heads.
- C. Lead Lining at Electrical Boxes, Medical Gas Penetrations, and Similar Conditions shall be shielded with the same thickness and the lead walls.

- D. Fasteners: Type S, bugle head screws complying with ASTM C 1002, not less than 1 inch (25mm) length for applying lead-lined gypsum board to non-structural metal framing.
- E. Fasteners: Type S-6 or greater fine thread rust resistant self-drilling screws complying with ASTM C 1002, not less than 1-1/4 inch [31mm] length, for applying lead-lined gypsum board to light gage metal framing having thickness of 0.033 to 0.112 inch [0.84 to 2.84 mm] thick.
- F. Fasteners: Type W, bugle head screws complying with ASTM C 1002, not less than 1-1/4 inch (31mm) length for applying lead-lined gypsum board to wood framing and furring.

2.4 FABRICATION

- A. Lead lining: Un-pierced lead permanently laminated to gypsum board in factory using manufacturer's recommended resilient latex adhesive.

2.5 SOURCE QUALITY CONTROL

- A. Obtain lead accessories and lead-lined gypsum board products from a single ISO 9001: 2008 certified manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that all items which are to be enclosed by Work of this Section have been permanently installed, inspected, and approved.
- B. Inspect framing and other substrates; verify that they are in proper condition to receive the work of this Section.

3.2 PREPARATION

- A. During the operation of work of this Section, protect existing work against damage by the exercise of reasonable care and precautions. Repair all existing materials which are damaged by Work of this Section, to match original profiles and finishes. Existing materials repaired shall be removed and replaced with new work to match existing.

3.3 INSTALLATION - GENERAL

- A. General: Perform erection procedures for the various gypsum board system conditions, except as otherwise specified, as set forth in GA 201, GA 216, the written instructions of manufacturer, together with the additional requirements specified herein and as indicated on the Drawings.
- B. Where fire-resistive rated assemblies are indicated, erect gypsum board systems in strict accordance with the manufacturers' UL listed test constructions for the required fire rating on each specific assembly.

3.4 INSTALLATION OF LEAD-LINED GYPSUM BOARD

- A. Prior to installation of lead-lined gypsum board:
 - 1. Install 2 inch [50mm] wide lead battens at all vertical stud framing (and ceiling joists). At corner intersections of walls (and ceilings) provide 3 inch [75mm] wide battens or, if framing allows, corner lapping of lead-lined gypsum board.
 - 2. Install lead lining at all electrical outlet boxes, medical gas boxes, and similar penetrations occurring in gypsum board.
 - 3. Make provisions for connection with lead-lined doorframes and cutouts for vision panels.
 - 4. Install screw tabs on studs where required.
- B. Screw-fasten boards to framing and furring, with ends and edges occurring over firm bearing. Screw fasten lead-lined gypsum panels 8 inches [200mm] on center at panel edges and 12 inches [300mm] on center to intermediate framing members.
 - 1. Erect all lead-lined gypsum board vertically on wall surfaces. Install boards horizontally where required by code.
 - 2. Erect ceiling gypsum boards to meet UL requirements, where applicable, stagger end joints over supports. Secure gypsum board with fasteners inserted through ceiling buttons; anchor fasteners directly to framing or suspended support system.
 - 3. Recess gypsum board screws slightly into board surface and cap.
- C. Wherever items penetrate the gypsum board surfaces, use extra care in cutting the gypsum board to ensure a uniformly dimensioned joint between the penetrating item and the gypsum board. Verify the expected deflection factor of the penetrating members, and cut the gypsum accordingly, to prevent damage thereto from the deflecting members.

3.5 TOLERANCES

- A. Maximum variation for gypsum board partitions and ceilings from true flatness: 1/8 inch [3mm] per 10 feet [3 m], noncumulative.

3.6 FIELD QUALITY CONTROL

- A. Field inspection and physicist testing to be performed under separate contract with Owner.

3.7 CLEANING

- A. General: Clean work under provisions of Section 017300 - EXECUTION.
 - 1. Upon completion of the work of this Section in any given area, remove tools, equipment and all rubbish and debris from the work area.
- B. Daily clean work areas by disposing of debris, scraps, and lead. Vacuum floor surfaces with HEPA (High Efficiency Particulate Air filter) vacuum in compliance with OSHA Standard 1926.62.

- C. After completion of the work of this Section, remove rubbish, tools and equipment, and clean all wall, partition, and floor areas free from deposits of lead, and other materials installed under this Section. Vacuum surfaces with HEPA vacuum in compliance with OSHA Standard 1926.62.

3.8 PROTECTION

- A. General Contractor is responsible to protect finished work under provisions of Section 015000 - TEMPORARY FACILITIES AND CONTROLS.

END OF SECTION 134919