PROJECT MANUAL

Anti-Ligature Upgrades, Multiple Assets

Fulton State Hospital

Fulton, Missouri

Designed By: L2E Solutions
20 S. Sarah Street
St. Louis, MO 63108

Date Issued: September 22, 2024

Project No.: M2312-01

STATE *of* MISSOURI

OFFICE *of* ADMINISTRATION

Facilities Management, Design and Construction

SECTION 000107 - PROFESSIONAL SEALS AND CERTIFICATIONS

PROJECT No: (M2312-01 Anti-Ligature Upgrades Multiple Assets Fulton State Hospital)

THE FOLLOWING DESIGN PROFESSIONALS HAVE SIGNED AND SEALED THE ORIGINAL PLANS AND SPECIFICATIONS FOR THIS PROJECT, WHICH ARE ON FILE WITH THE DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION:

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St. Louis, MO 63108

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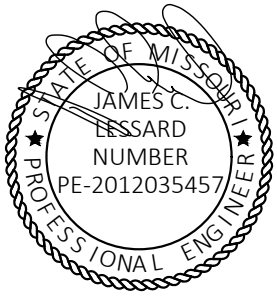

SIGNED: 09/22/24

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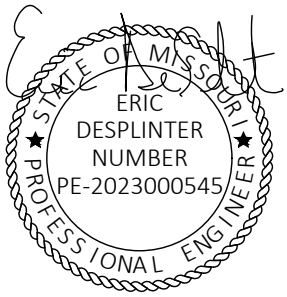

SIGNED: 09/22/24

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section provides a comprehensive list of the drawings that comprise the Bid Documents for this project.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 LIST OF DRAWINGS

A. The following list of drawings is a part of the Bid Documents:

	TITLE	SHEET #	DATE	CAD #
1.	COVER SHEET	G-000	9/22/2024	G-000
2.	PROJECT INFORMATION	G-001	9/22/2024	G-001
3.	GUHLEMAN BLDG. WEST (SORTS) FIRST FLR – G01/S01	A-101	9/22/2024	A-FP-01
4.	GUHLEMAN BLDG. WEST (SORTS) FIRST FLR – G02/S02	A-102	9/22/2024	A-FP-02
5.	GUHLEMAN BLDG. WEST (SORTS) SECOND FLR – G03/S03	A-103	9/22/2024	A-FP-03
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7.	GUHLEMAN BLDG. EAST (SORTS) FIRST FLR – G05/S05	A-105	9/22/2024	A-FP-05
8.	GUHLEMAN BLDG. EAST (SORTS) FIRST FLR – G06/S06	A-106	9/22/2024	A-FP-06
9.	HEARNES BLDG. – H01	A-107	9/22/2024	A-FP-07
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61.	PLUMBING GUHLEMAN EAST BUILDING – FIRST FLOOR – G5 - REMODEL	P-113	9/22/2024	P-FP-01
62.	PLUMBING GUHLEMAN EAST BUILDING – FIRST FLOOR – G6 - REMODEL	P-114	9/22/2024	P-FP-01
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64.	PLUMBING HEARNES BUILDING - H2 - REMODEL	P-116	9/22/2024	P-FP-01
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END OF SECTION 000115

SECTION 001116 - INVITATION FOR BID

1.0 OWNER:

A. The State of Missouri
Office of Administration,
Division of Facilities Management, Design and Construction
Jefferson City, Missouri

2.0 PROJECT TITLE AND NUMBER:

A. Anti-Ligature Upgrades, Multiple Assets
Fulton State Hospital
Fulton, Missouri
Project No.: M2312-01

3.0 BIDS WILL BE RECEIVED:

A. Until: 1:30 PM, April 17, 2025

B. **Only electronic bids sent to FMDCBids@oa.mo.gov shall be accepted: (See Instructions to Bidders for further detail)**

4.0 DESCRIPTION:

A. Scope: The project includes removal and replacement of existing casework, display cabinets, grilles, devices , fixtures, ceilings, partitions and other items to meet ligature resistant requirements.

B. MBE/WBE/SDVE Goals: MBE 10%, WBE 10%, and SDVE 3%. **NOTE: Only MBE/WBE firms certified by the State of Missouri Office of Equal Opportunity as of the date of bid opening, or SDVE(s) meeting the requirements of Section 34.074, RSMo and 1 CSR 30-5.010, can be used to satisfy the MBE/WBE/SDVE participation goals for this project.**

5.0 PRE-BID MEETING:

A. Place/Time**:** 11:00 AM, April 1, 2025, at Fulton State Hospital - Environmental Control Center (Entrance off Wood Street), 600 East 5th Street, Fulton, MO.

B. Access to State of Missouri property requires presentation of a photo ID by all persons

6.0 HOW TO GET PLANS & SPECIFICATIONS:

A. View Only Electronic bid sets are available at no cost or paper bid sets for a deposit of $100.00 from American Document Solutions (ADS). MAKE CHECKS PAYABLE TO: American Document Solutions. Mail to: American Document Solutions, 1400 Forum Blvd., Suite 7A, Columbia, Missouri 65203. Phone 573-446-7768, Fax 573-355-5433, https://www.adsplanroom.net. NOTE: Prime contractors will be allowed a maximum of two bid sets at the deposit rate shown above. Other requesters will be allowed only one bid set at this rate. Additional bid sets or parts thereof may be obtained by any bidder at the cost of printing and shipping by request to American Document Solutions at the address shown above. Bidder must secure at least one bid set to become a planholder.

B. **Refunds: Return plans and specifications in unmarked condition within 15 working days of bid opening to American Document Solutions, 1400 Forum Blvd., Suite 7A, Columbia, Missouri 65203. Phone 573-446-7768, Fax 573-355-5433. Deposits for plans not returned within 15 working days shall be forfeited.**

C. Information for upcoming bids, including downloadable plans, specifications, Invitation for Bid, bid tabulation, award, addenda, and access to the ADS planholders list, is available on the Division of Facilities Management, Design and Construction's web site: https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans.

7.0 POINT OF CONTACT:

A. Designer: L2E Solutions, Elaine Palliser Lewis, (314) 730-2779, email: elaine.lewis@l2eco.com

B. Project Manager: Jared Cook, (573) 690-6733, email: jared.cook2@oa.mo.gov

8.0 GENERAL INFORMATION:

A. The State reserves the right to reject any and all bids and to waive all informalities in bids. No bid may be withdrawn for a period of 20 working days subsequent to the specified bid opening time. The contractor shall pay not less than the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed, as determined by the Missouri Department of Labor and Industrial Relations and as set out in the detailed plans and specifications.

B. Bid results will be available at https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans after it is verified that at least one bid is awardable and affordable.

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SECTION 002113 – INSTRUCTIONS TO BIDDERS

1.0 - SPECIAL NOTICE TO BIDDERS

A. If awarded a contract, the Bidder's employees, and the employees of all subcontractors, who perform the work on the project must adhere to requirements in Section 013513 – Site Security and Health Requirements as applicable per Agency.

B. The Bidder's prices shall include all city, state, and federal sales, excise, and similar taxes that may lawfully be assessed in connection with the performance of work, and the purchased of materials to be incorporated in the work. **THIS PROJECT IS NOT TAX EXEMPT.**

2.0 - BID DOCUMENTS

A. The number of sets obtainable by one (1) party may be limited in accordance with available supply.

B. For the convenience of contractors, subcontractors and suppliers, bidding documents are available on the Owner's website at https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans.

3.0 - BIDDERS' OBLIGATIONS

A. Bidders must carefully examine the entire site of the work and shall make all reasonable and necessary investigations to inform themselves thoroughly as to the facilities available as well as to all the difficulties involved in the completion of all work in accordance with the specifications and the plans. Bidders are required to examine all maps, plans and data mentioned in the specifications. No plea of ignorance concerning observable existing conditions or difficulties that may be encountered in the execution of the work under this contract will be accepted as an excuse for any failure or omission on the part of the successful Bidder (contractor) to fulfill every detail of the requirements of the contract, nor accepted as a basis for any claims for extra compensation or time extension.

B. Under no circumstances will Bidders give their plans and specifications to other Bidders. It is highly encouraged, but not required, that all Bidders be on the official planholders list to receive project updates including but not limited to any addenda that are issued during the bidding process.

4.0 - INTERPRETATIONS

A. No Bidder shall be entitled to rely on oral or written representations from any person as to the meaning of the plans and specifications or the acceptability of alternate products, materials, form or type of construction.

B. Bidders shall make all requests for interpretations in writing and submit all requests to the Project Designer and Project Manager identified in Section 007300 – Supplementary Conditions with all necessary supporting documentation no less than five (5) working days before opening of bids. Responses to requests for interpretation will be issued via a written addendum and will be sent as promptly as is practicable to all official planholders and posted on the Owner's website. All such addenda shall become part of the bid and contract documents.

C. Bidders shall make all requests for an "Acceptable Substitution" on the Section 006325 Substitution Request Form. The request shall be emailed to the Project Designer and Project Manager identified in Section 007300 – Supplementary Conditions no less than five (5) working days before opening of bids. Responses to requests for substitutions will be issued via a written addendum and will be sent as promptly as is practicable to all official planholders and posted on the Owner's website. All such addenda shall become part of the bid and contract documents.

D. An "Acceptable Substitution" requested after the award of bid will only be approved if proven to the satisfaction of the Owner and the Designer that the product is acceptable in design, strength, durability, usefulness, and convenience for the purpose intended. Approval of the substitution after award is at the sole discretion of the Owner and all requests of this nature must be submitted in accordance with Article 3.1 of the General Conditions.

5.0 - BIDS AND BIDDING PROCEDURE

A. Bidders shall submit all submission forms and accompanying documents listed in Section 004113 – Bid Form, Article 5.0, Attachments to Bid by the stated time on the bid documents or the bid will be rejected for being non-responsive.

B. Depending on the specific project requirements, **the following is a GENERIC list** of all possible bid forms that may be due with bid submittals. Bidders must verify each specific project's requirements in Section 004113 to ensure they have provided all the required documentation with their submission.

Bid Submittal – due before stated date and time of bid opening (see IFB):

004113	Bid Form (all pages are always required)
004322	Unit Prices Form
004336	Proposed Subcontractors Form
004337	MBE/WBE/SDVE Compliance Evaluation Form
004338	MBE/WBE/SDVE Eligibility Determination for Joint Ventures
004339	MBE/WBE/SDVE GFE Determination
004340	SDVE Business Form
004541	Affidavit of Work Authorization
004545	Anti-Discrimination Against Israel Act Certification form

C. The Bidder shall submit its bid on the forms provided by the Owner in the same file format (PDF) with each space fully and properly completed, typewritten or legibly printed, including all amounts required for alternate bids, unit prices, cost accounting data, etc. The Owner will reject bids that are not on the Owner's forms or that do not contain all requested information. All forms can be found on the Owner's website at https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans and shall be submitted with your bid to FMDCBids@oa.mo.gov.

D. All bids shall be submitted without additional terms and conditions, modifications, or reservations. The completed forms should not include interlineations, alterations, or erasures. Bids not in compliance with the requirements of this paragraph will be rejected as non-responsive.

E. All bids shall be accompanied by a bid bond executed by the bidder and a duly authorized surety company, certified check, cashier's check or bank draft made payable to the Division of Facilities Management, Design and Construction, State of Missouri, in the amount indicated in the bid documents in Section 004113. Failure of the Bidder to submit the duly authorized bid bond or the full amount required shall be sufficient cause to reject his bid. The Bidder agrees that the proceeds of the check, draft, or bond shall become the property of the State of Missouri, if for any reason the Bidder withdraws his bid after bid closing or if the Bidder, within ten (10) working days after notification of award, refuses or is unable to 1) execute the tendered contract, 2) provide an acceptable performance and payment bond, or 3) provide evidence of required insurance coverage.

F. The bid bond check or draft submitted by the successful Bidder will be returned after the receipt of an acceptable performance and payment bond and execution of the formal contract. Checks or drafts of all other Bidders will be returned within a reasonable time after it is determined that the bid represented by same will receive no further consideration by the State of Missouri.

6.0 - SIGNING OF BIDS

A. A bid should contain the full and correct legal name of the Bidder. If the Bidder is an entity registered with the Missouri Secretary of State, the Bidder's name on the bid form should appear as shown in the Secretary of State's records. If the Bidder is an entity organized in a state other than Missouri, the Bidder must provide a Certificate of Authority to do business in the State of Missouri.

B. If the successful Bidder is doing business in the State of Missouri under a fictitious name, the Bidder shall furnish to Owner, attached to the Bid Form, a properly certified copy of the certificate of Registration of Fictitious Name from the State of Missouri, and such certificate shall remain on file with the Owner.

C. A bid from an individual shall be signed as noted on the Bid Form.

D. A bid from a partnership or joint venture shall require only one signature of a partner, an officer of the joint venture authorized to bind the venture, or an attorney-in-fact. If the bid is signed by an officer of

a joint venture or an attorney-in-fact, a document evidencing the individual's authority to execute contracts should be included with the bid form.

E. A bid from a limited liability company (LLC) shall be signed by a manager or a managing member of the LLC.

F. A bid from a corporation shall have the correct corporate name thereon and the signature of an authorized officer of the corporation. Title of office held by the person signing for the corporation shall appear, along with typed name of said individual and the corporate license number shall be provided. In addition, for corporate proposals, the President or Vice-President listed per the current filing with the Missouri Secretary of State should sign as the Bidder. If the signatory is other than the corporate president or vice president, the bidder must provide satisfactory evidence that the signatory has the legal authority to bind the corporation.

7.0 - RECEIVING BID SUBMITTALS

A. It is the Bidder's sole responsibility to ensure receipt of the bid submittals by Owner on or before the date and time specified in the Invitation for Bid or as modified via written addenda. Bids received after the date and time specified will not be considered by the Owner.

B. All bids shall be received via email at FMDCBids@oa.mo.gov and bids received by the Owner through any other means, including hard copies, will not be considered, and will be discarded by the Owner unopened.

8.0 - MODIFICATION AND WITHDRAWAL OF BIDS

A. Bidder may withdraw a bid at any time prior to the scheduled closing time for receipt of bids, but no bidder may withdraw his bid for a period of twenty (20) working days after the scheduled closing time for receipt of bids.

B. Bidder may modify a bid until the scheduled closing time by sending a revised bid to FMDCBids@oa.mo.gov with a note in the subject line and body of the email that it is a revised bid. All revised bids must be submitted to FMDCBids@oa.mo.gov, revised bids sent any other way will not be considered.

9.0 - AWARD OF CONTRACT

A. The Owner reserves the right to reject any and/or all bids and further to waive all informalities in bidding when deemed in the best interest of the State of Missouri.

B. The Owner reserves the right to let other contracts in connection with the work including, but not limited to, contracts for the furnishing and installation of furniture, equipment, machinery, appliances and other apparatuses.

C. The Owner will award a contract to the lowest, responsive, and responsible Bidder in accordance with Section 8.250, RSMo. No contract will be awarded to any Bidder who has had a contract with the Owner terminated within the preceding twelve months for material breach of contract or who has been suspended or debarred by the Owner.

D. Award of alternates, if any, will be made in numerical order unless all bids received are such that the order of acceptance of alternates does not affect the determination of the lowest, responsive, responsible bidder.

E. No award shall be considered binding upon the Owner until the written contract has been properly executed and the following documentation has been provided: 1) performance and payment bond consistent with Article 6.1 of the General Conditions; 2) proof of the required insurance coverage; 3) an executed Section 004541 - Affidavit of Work Authorization form; and 4) documentation evidence enrollment and participation in a federal work authorization program.

F. Failure to execute and return the contract and associated documents within the prescribed period shall be treated, at the option of the Owner, as a breach of Bidder's obligation and the Owner shall be under no further obligation to Bidder.

G. Transient employers subject to Sections 285.230 and 285.234, RSMo, (out-of-state employers who temporarily transact any business in the State of Missouri) may be required to file a bond with the

Missouri Department of Revenue. No contract will be awarded by the Owner unless the successful Bidder certifies that he has complied with all applicable provisions of Section 285.230-234.

H. Sections 285.525 and 285.530, RSMo, require business entities to enroll and participate in a federal work authorization program in order to be eligible to receive award of any state contract in excess of $5,000. Bidders should submit with their bid an Affidavit of Work Authorization (Section 004541) along with appropriate documentation evidencing such enrollment and participation. Bidders must also submit an E-Verify Memorandum before the Owner may award a contract to the Bidder. Information regarding a E-Verify is located at https://www.uscis.gov/e-verify/. The contractor shall be responsible for ensuring that all subcontractors and suppliers associated with this contract enroll in E-Verify.

I. The successful Bidder must be registered in MissouriBUYS powered by MOVERS at https://missouribuys.mo.gov/supplier-registration# as an approved vendor prior to being issued a contract.

10.0 - CONTRACT SECURITY

A. The successful Bidder shall furnish a performance/payment bond as set forth in General Conditions Article 6.1 prior to the State executing the contract and issuing a notice to proceed.

11.0 - LIST OF SUBCONTRACTORS

A. If required by "Section 004113 – Bid Form," each Bidder must submit as part of their bid a list of subcontractors to be used in performing the work (Section 004336). The list must specify the name of the single designated subcontractor, manufacturer, or suppliers for each category of work listed in "Section 004336 - Proposed Subcontractors Form." If work within a category will be performed by more than one subcontractor, the bidder must provide the name of each subcontractor and specify the exact portion of the work to be done by each. If the Bidder intends to perform any of the designated subcontract work with the use of his own employees, the Bidder shall make that fact clear, by listing his own firm for the subject category. **If any category of work is left vacant or if more than one subcontractor is listed for any category without designating the portion of work to be performed by each, the bid shall be rejected.**

12.0 - WORKING DAYS

A. Contract duration time is stated in working days and will use the following definition in determining the actual calendar date for contract completion:

1. Working days are defined as all calendar days except Saturdays, Sundays and the following State of Missouri observed holidays: New Year's Day, Martin Luther King, Jr. Day, Lincoln Day, Washington's Birthday, Truman Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day and Christmas Day.

13.0 - AMERICAN AND MISSOURI - MADE PRODUCTS AND FIRMS

A. By signing the bid form and submitting a bid on this project, the Bidder certifies that it will use American and Missouri products as set forth in Article 1.7 of the General Conditions. Bidders are advised to review those requirements carefully prior to bidding.

B. A preference shall be given to Missouri firms, corporations or individuals, or firms, corporations or individuals that maintain Missouri offices or places of business, when the quality of performance promised is equal or better and the price quoted is the same or less.

C. Pursuant to Section 34.076, RSMo, a contractor or Bidder domiciled outside the boundaries of the State of Missouri shall be required, in order to be successful, to submit a bid the same percent less than the lowest bid submitted by a responsible contractor or Bidder domiciled in Missouri as would be required for such a Missouri domiciled contractor or Bidder to succeed over the bidding contractor or Bidder domiciled outside Missouri on a like contract or bid being let in the Bidder's domiciliary state and, further, the contractor or Bidder domiciled outside the boundaries of Missouri shall be required to submit an audited financial statement as would be required of a Missouri domiciled contractor or Bidder on a like contract or bid being let in the domiciliary state of that contractor or Bidder.

14.0 – ANTI-DISCRIMINATION AGAINST ISRAEL ACT CERTIFICATION:

A. If the Bidder meets the section 34.600, RSMo., definition of a "company" and the Bidder has ten or more employees, the Bidder must certify in writing that the Bidder is not currently engaged in a boycott of goods or services from the State of Israel and shall not engage in a boycott of goods or services from the State of Israel, if awarded a contract, for the duration of the contract. The Bidder is required to complete and submit the applicable portion of Section 004545 - Anti-Discrimination Against Israel Act Certification with its Bid Form. The applicable portion of the exhibit must be submitted prior to execution of a contract by the Owner and issuance of Notice to Proceed.

15.0 - MBE/WBE/SDVE INSTRUCTIONS

A. Definitions:

1. **"MBE"** means a Minority Business Enterprise.

2. **"MINORITY"** has the same meaning as set forth in 1 C.S.R. 10-17.010.

3. **"MINORITY BUSINESS ENTERPRISE"** has the same meaning as set forth in section 37.020, RSMo.

4. **"WBE"** means a Women's Business Enterprise.

5. **"WOMEN'S BUSINESS ENTERPRISE"** has the same meaning as set forth in section 37.020, RSMo.

6. **"SDVE"** means a Service-Disabled Veterans Enterprise.

7. **"SERVICE-DISABLED VETERAN"** has the same meaning as set forth in section 34.074, RSMo.

8. **"SERVICE-DISABLED VETERAN ENTERPRISE"** has the same meaning as "Service-Disabled Veteran Business" set forth in section 34.074, RSMo.

B. MBE/WBE/SDVE General Requirements:

1. For all bids greater than $100,000, the Bidder shall obtain MBE, WBE and SDVE participation in an amount equal to or greater than the percentage goals set forth in the Invitation for Bid and the Bid Form, unless the Bidder is granted a Good Faith Effort waiver by the Director of the Division, as set forth below. If the Bidder does not meet the MBE, WBE and SDVE goals, or make a good faith effort to do so, the Bidder shall be nonresponsive, and its bid shall be rejected.

2. The Bidder should submit with its bid all the information requested in the MBE/WBE/SDVE Compliance Evaluation Form for every MBE, WBE, or SDVE subcontractor or material supplier the Bidder intends to use for the contract work. The Bidder is required to submit all MBE/WBE/SDVE documentation before the stated time and date set forth in the Invitation for Bid. If the Bidder fails to provide such information by the specified date and time, the Owner shall reject the bid.

3. The Director reserves the right to request additional information from a Bidder to clarify the Bidder's proposed MBE, WBE, and/or SDVE participation. The Bidder shall submit the clarifying information requested by the Owner within two (2) working days of receiving the request for clarification.

4. Pursuant to section 34.074, RSMo, a Prime Bidder that qualifies as an SDVE shall receive a three-percentage point bonus preference in the contract award evaluation process. The bonus preference will be calculated and applied by reducing the bid amount of the eligible SDVE by three percent of the apparent low responsive Bidder's bid. Based on this calculation, if the eligible SDVE's evaluation is less than the apparent low responsive Bidder's bid, the eligible SDVE's bid will become the apparent low responsive bid. This reduction is for evaluation purposes only and will have no impact on the actual amount(s) of the bid or the amount(s) of any contract awarded. In order to be eligible for the SDVE preference, the Bidder must complete and submit with its bid the Missouri Service-Disabled Veteran Business Form, and any information required by the form.

C. Computation of MBE/WBE/SDVE Goal Participation:

1. A Bidder who is a MBE, WBE, or SDVE may count 100% of the contract towards the MBE, WBE or SDVE goal, less any amounts awarded to another MBE, WBE or SDVE. (NOTE: a MBE firm that bids as general contractor must obtain WBE and SDVE participation; a WBE firm that bids as a general contractor must obtain MBE and SDVE participation; and a SDVE firm that bids as general

contractor must obtain MBE and WBE participation.) For the remaining contract amount to be counted towards the MBE, WBE or SDVE goal, the Bidder must complete the MBE/WBE/SDVE Compliance Evaluation Form (Section 004337) identifying itself as an MBE, WBE or SDVE.

2. The total dollar value of the work granted to a certified MBE, WBE or SDVE by the Bidder shall be counted towards the applicable goal.

3. Expenditures for materials and supplies obtained from a certified MBE, WBE, or SDVE supplier or manufacturer may be counted towards the MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE assumes the actual and contractual responsibility for the provision of the materials and supplies.

4. The total dollar value of the work granted to a second or subsequent tier subcontractor or a supplier may be counted towards a Bidder's MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE properly assumes the actual and contractual responsibility for the work.

5. The total dollar value of work granted to a certified joint venture equal to the percentage of the ownership and control of the MBE, WBE, or SDVE partner in the joint venture may be counted towards the MBE/WBE/SDVE goals.

6. Only expenditures to a MBE, WBE, or SDVE that performs a commercially useful function in the work may be counted towards the MBE, WBE and SDVE goals. A MBE, WBE, or SDVE performs a commercially useful function when it is responsible for executing a distinct element of the work and carrying out its responsibilities by performing, managing and supervising the work or providing supplies or manufactured materials.

D. Certification of MBE/WBE/SDVE Subcontractors:

1. In order to be counted towards the goals, an MBE or WBE must be certified by the State of Missouri Office of Equal Opportunity and an SDVE must be certified by the State of Missouri, Office of Equal Opportunity or by the Federal U.S. Small Business Administration directory.

2. The Bidder may determine the certification status of a proposed MBE or WBE subcontractor or supplier by referring to the Office of Equal Opportunity (OEO)'s online MBE/WBE directory https://apps1.mo.gov/MWBCertifiedFirms/. The Bidder may determine the eligibility of a SDVE subcontractor or supplier by referring to the Office of Equal Opportunity online SDVE directory at https://oeo.mo.gov/sdve-certification-program/ or the Federal U.S. Small Business Administration directory https://veterans.certify.sba.gov/#search.

3. Additional information, clarifications, or other information regarding the MBE/WBE/SDVE listings in the directories may be obtained by contacting the Contract Specialist of record as shown in the Supplementary Conditions (Section 007300).

E. Waiver of MBE/WBE/SDVE Participation:

1. If a Bidder has made a good faith effort to secure the required MBE, WBE and/or SDVE participation and has failed, the Bidder shall submit with its bid the information requested in MBE/WBE/SDVE Good Faith Effort (GFE) Determination form. The Director will determine if the Bidder made a good faith effort to meet the applicable goals. If the Director determines that the Bidder did not make a good faith effort, the bid shall be rejected as being nonresponsive to the bid requirements. Bidders who demonstrate that they have made a good faith effort to include MBE, WBE, and/or SDVE participation will be granted a waiver and will be considered to be responsive to the applicable participation goals, regardless of the percent of actual participation obtained, if the bid is otherwise acceptable.

2. In determining whether a Bidder has made a good faith effort to obtain MBE, WBE and/or SDVE participation, the Director may evaluate the factors set forth in 1 CSR 30-5.010(6)(C) and the following:

   a. The amount of actual participation obtained;

b. How and when the Bidder contacted potential MBE, WBE, and SDVE subcontractors and suppliers;

c. The documentation provided by the Bidder to support its contacts, including whether the Bidder provided the names, addresses, phone numbers, and dates of contact for MBE/WBE/SDVE firms contacted for specific categories of work;

d. If project information, including plans and specifications, were provided to MBE/WBE/SDVE subcontractors;

e. Whether the Bidder made any attempts to follow-up with MBE, WBE or SDVE firms prior to bid;

f. Amount of bids received from any of the subcontractors and/or suppliers that the Bidder contacted;

g. The Bidder's stated reasons for rejecting any bids;

F. Contractor MBE/WBE/SDVE Obligations

1. If awarded a contract, the Bidder will be contractually required to subcontract with or obtain materials from the MBE, WBE, and SDVE firms listed in its bid, in amounts equal to or greater than the dollar amount in the bid, unless the amount is modified in writing by the Owner.

2. If the Contractor fails to meet or maintain the participation requirements contained in the Contractor's bid, the Contractor must satisfactorily explain to the Director why it cannot comply with the requirement and why failing meeting the requirement was beyond the Contractor's control. If the Director finds the Contractor's explanation unsatisfactory, the Director may take any appropriate action including, but not limited to:

   a. Declaring the Contractor ineligible to participate in any contracts with the Division for up to twelve (12) months (suspension); and/or

   b. Declaring the Contractor be nonresponsive to the Invitation for Bid, or in breach of contract and rejecting the bid or terminating the contract.

3. If the Contractor replaces an MBE, WBE, or SDVE during the course of the contract, the Contractor shall replace it with another MBE, WBE, or SDVE or make a good faith effort to do so. All MBE, WBE and SDVE substitutions must be approved by the Director in writing.

4. The Contractor shall provide the Owner with regular reports on its progress in meeting its MBE/WBE/SDVE obligations. At a minimum, the Contractor shall report the dollar-value of work completed by each MBE, WBE, or SDVE during the preceding month and the cumulative total of work completed by each MBE, WBE or SDVE to date with each monthly application for payment. The Contractor shall also make a final report, which shall include the total dollar-value of work completed by each MBE, WBE, and SDVE during the entire contract.

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State of Missouri
Construction Contract

THIS AGREEMENT is made (DATE) by and between:

Contractor Name and Address

hereinafter called the "Contractor," and the **State of Missouri**, hereinafter called the **"Owner"**, represented by the Office of Administration, Division of Facilities Management, Design and Construction.

WITNESSETH, that the Contractor and the Owner, for the consideration stated herein agree as follows:

ARTICLE 1. STATEMENT OF WORK

The Contractor shall furnish all labor and materials and perform all work required for furnishing and installing all labor, materials, equipment and transportation and everything necessarily inferred from the general nature and tendency of the plans and specifications for the proper execution of the work for:

Project Name: **Anti-Ligature Upgrades, Multiple Assets**
Fulton State Hospital
Fulton, Missouri

Project Number: **M2312-01**

in strict accordance with the Contract Documents as enumerated in Article 7, all of which are made a part hereof.

ARTICLE 2. TIME OF COMPLETION

The contract performance time is **150 working days** from the transmittal date of this agreement. The contract completion date is **MONTH, DAY, YEAR**. This time includes ten (10) working days for the Contractor to receive, sign and return the contract form along with required bonding and insurance certificates. Failure of the Contractor to provide correct bonding and insurance within the ten (10) working days shall not be grounds for a time extension. Receipt of proper bonding and insurance is a condition precedent to the formation of the contract and if not timely received, may result in forfeiture of the Contractor's bid security. Work may not commence until the Owner issues a written Notice to Proceed and must commence within seven (7) working days thereafter.

ARTICLE 3. LIQUIDATED DAMAGES

Whenever time is mentioned in this contract, time shall be and is of the essence of this contract. The Owner would suffer a loss should the Contractor fail to have the work embraced in this contract fully completed on or before the time above specified. THEREFORE, the parties hereto realize in order to adjust satisfactorily the damages on account of such failure that it might be impossible to compute accurately or estimate the amount of such loss or damages which the Owner would sustain by reason of failure to complete fully said work within the time required by this contract. The Contractor hereby covenants and agrees to pay the Owner, as and for **liquidated damages, the sum of $700** per day for each and every day, Sunday and legal holidays excepted, during which the work remains incomplete and unfinished. Any sum which may be due the Owner for such damages shall be deducted and retained by the Owner from any balance which may be due the Contractor when said work shall have been finished and accepted. But such provisions shall not release the Bond of the Contractor from liability according to its terms. In case of failure to complete, the Owner will be under no obligation to show or prove any actual or specific loss or damage.

ARTICLE 4. CONTRACT SUM

The Owner shall pay the Contractor for the prompt, faithful and efficient performance of the conditions and undertakings of this contract, subject to additions, and deductions as provided herein, in current funds the sum of:

Base Bid: $

Accepted Alternates, if applicable to the Project and accepted by the Owner.

TOTAL CONTRACT AMOUNT: ($CONTRACT AMOUNT)

ARTICLE 5. PREVAILING WAGE RATE

MISSOURI PREVAILING WAGE LAW (Sections 290.210 to 290.340, RSMo): The Contractor shall pay not less than the specified hourly rate of wages, as set out in the wage order attached to and made part of the specifications for work under this contract, to all workers performing work under the contract, in accordance with sections 290.210 to 290.340, RSMo. The Contractor shall forfeit a penalty to the Owner of one hundred dollars per day (or portion of a day) for each worker that is paid less than the specified rates for any work done under the contract by the Contractor or by any subcontractor, in accordance with section 290.250, RSMo.

DAVIS-BACON ACT: If this Project is financed in whole or in part from Federal funds (as indicated in the Instructions to Bidders or other bid or contract documents for this Project), then this contract shall be subject to all applicable federal labor statutes, rules and regulations, including provisions of the Davis-Bacon Act, 40 U.S.C. §3141 et seq., and the "Federal Labor Standards Provisions," as further set forth in Section 007333 – Supplementary General Conditions for Federally Funded/Assisted Construction Projects, which is incorporated into the contract by reference. Where the Missouri Prevailing Wage Law and the Davis-Bacon Act require payment of different wages for work performed under this contract, the Contractor and all Subcontractors shall pay the greater of the wages required under either law, on a classification-by-classification basis.

ARTICLE 6. MINORITY/WOMEN/SERVICE DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION

The Contractor has been granted a waiver of the 10% MBE and 10% WBE and 3% SDVE participation goals. The Contractor agrees to secure the MBE/WBE/SDVE participation amounts for this project as follows: (OR)

The Contractor has met the MBE/WBE/SDVE participation goals and agrees to secure the MBE/WBE/SDVE participation amounts for this project as follows:

MBE/WBE/SDVE Firm: Subcontract Amt:$
MBE/WBE/SDVE Firm: Subcontract Amt:$
MBE/WBE/SDVE Firm: Subcontract Amt:$

Total $

MBE/WBE/SDVE assignments identified above shall not be changed without a contract change signed by the Owner.

The Director of the Division of Facilities Management, Design and Construction or his Designee shall be the final authority to resolve disputes and disagreements between the Contractor and the MBE/WBE/SDVE firms listed above when such disputes impact the subcontract amounts shown above.

ARTICLE 7. CONTRACT DOCUMENTS

The following documents are hereby incorporated into this contract by reference (all division/section numbers and titles are as utilized in the Project Manual published by the Owner for this Project):

1. Division 0 – Procurement and Contracting Information, including, but not limited to:
    a. Invitation for Bid (Section 001116)
    b. Instructions to Bidders (Section 002113)
    c. Supplementary Instructions to Bidders (if applicable) (Section 002213)

d. The following documents as completed and executed by the Contractor and accepted by the Owner, if applicable:
    i. Bid Form (Section 004113)
    ii. Unit Prices (Section 004322)
    iii. Proposed Contractors Form (Section 004336)
    iv. MBE, WBE, SDVE Compliance Evaluation Form(s) (Section 004337)
    v. MBE, WBE, SDVE Eligibility Determination Form for Joint Ventures (Section 004338)
    vi. MBE, WBE, SDVE Good Faith Effort (GFE) Determination Form (Section 004339)
    vii. Missouri Service Disabled Veteran Business Form (Section 004340)
    viii. Affidavit of Work Authorization (Section 004541)
    ix. Affidavit for Affirmative Action (Section 005414), if applicable
e. Performance and Payment Bond, completed and executed by the Contractor and surety (Section 006113)
f. General Conditions (Section 007213)
g. Supplementary Conditions (Section 007300)
h. Supplementary General Conditions for Federally Funded/Assisted Construction Projects (Section 007333), if applicable
i. Wage Rate(s) (Section 007346)

2. Division 1 – General Requirements
3. All Drawings identified in the Project Manual
4. All Technical Specifications included in the Project Manual
5. Addenda, if applicable

ARTICLE 8 – CERTIFICATION

By signing this contract, the Contractor hereby re-certifies compliance with all legal requirements set forth in Section 6.0, Bidder's Certifications of the Bid Form.

By signature below, the parties hereby execute this contract document.

APPROVED:

_____ _____

Brian Yansen, Director
Division of Facilities Management,
Design and Construction

Contractor's Authorized Signature

I, Corporate Secretary, certify that I am Secretary of the corporation named above and that (CONTRACTOR NAME), who signed said contract on behalf of the corporation, was then (TITLE) of said corporation and that said contract was duly signed for and in behalf of the corporation by authority of its governing body, and is within the scope of its corporate powers.

_____

Corporate Secretary

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Bond No._____

SECTION 006113 - PERFORMANCE AND PAYMENT BOND FORM

KNOW ALL MEN BY THESE PRESENTS, THAT we _____

as principal, and _____

_____as Surety, are held and firmly bound unto the

STATE OF MISSOURI. in the sum of _____ Dollars ($)

for payment whereof the Principal and Surety bind themselves, their heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

WHEREAS, the Principal has, by means of a written agreement dated the _____

day of_____, 20_____, enter into a contract with the State of Missouri for

_____

_____

_____

(Insert Project Title and Number)

NOW, THEREFORE, if the Principal shall faithfully perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the State of Missouri, with or without notice to the Surety and during the life of any guaranty required under the contract; and shall also faithfully perform and fulfill all undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made with or without notice to the Surety; and shall also promptly make payment for materials incorporated, consumed or used in connection with the work set forth in the contract referred to above, and all insurance premiums, both compensation and all other kinds of insurance, on said work, and for all labor performed on such work, whether by subcontractor or otherwise, at not less than the prevailing hourly rate of wages for work of a similar character (exclusive of maintenance work) in the locality in which the work is performed and not less than the prevailing hourly rate of wages for legal holiday and overtime work (exclusive of maintenance work) in the locality in which the work is performed both as determined by the Department of Labor and Industrial Relations or determined by the Court of Appeal, as provided for in said contract and in any and all duly authorized modifications of said contract that may be hereafter made, with or without notice to the Surety, then, this obligation shall be void and of no effect, but it is expressly understood that if the Principal should make default in or should fail to strictly, faithfully and efficiently do, perform and comply with any or more of the covenants, agreements, stipulations, conditions, requirements or undertakings, as specified in or by the terms of said contract, and with the time therein named, then this obligation shall be valid and binding upon each of the parties hereto and this bond shall remain in full force and effect; and the same may be sued on at the instance of any material man, laborer, mechanic, subcontractor, individual, or otherwise to whom such payment is due, in the name of the State of Missouri, to the use of any such person.

AND, IT IS FURTHER specifically provided that any modifications which may hereinafter be made in the terms of the contract or in the work to be done under it or the giving by the Owner of any extension of the time for the performance of the contract or any other forbearance on the part of either the Owner or the Principal to the other, shall not in any way release the Principal and the Surety, or either or any of them, their heirs, executors, administrators and successors, from their liability hereunder, notice to the Surety of any such extension, modifications or forbearance being hereby waived.

IN WITNESS WHEREOF, the above bounden parties have executed the within instrument this _____ day of _____, 20 ____.

AS APPLICABLE:

AN INDIVIDUAL

Name: _____

Signature: _____

A PARTNERSHIP

Name of Partner: _____

Signature of Partner: _____

Name of Partner: _____

Signature of Partner: _____

CORPORATION

Firm Name: _____

Signature of President: _____

SURETY

Surety Name: _____

Attorney-in-Fact: _____

Address of Attorney-in-Fact: _____

_____

Telephone Number of Attorney-in-Fact: _____

Signature Attorney-in-Fact: _____

NOTE: Surety shall attach Power of Attorney

STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

PRODUCT SUBSTITUTION REQUEST

PROJECT NUMBER

PROJECT TITLE AND LOCATION

CHECK APPROPRIATE BOX

☐ SUBSTITUTION PRIOR TO BID OPENING
(Minimum of (5) working days prior to receipt of Bids as per Article 4 – Instructions to Bidders)

☐ SUBSTITUTION FOLLOWING AWARD
(Maximum of (20) working days from Notice to Proceed as per Article 3 – General Conditions)

FROM: BIDDER/CONTRACTOR (PRINT COMPANY NAME)

TO: ARCHITECT/ENGINEER (PRINT COMPANY NAME)

Bidder/Contractor hereby requests acceptance of the following product or systems as a substitution in accordance with provisions of Division One of the Bidding Documents:

SPECIFIED PRODUCT OR SYSTEM

SPECIFICATION SECTION NO.

SUPPORTING DATA

☐ Product data for proposed substitution is attached (include description of product, standards, performance, and test data)

☐ Sample ☐ Sample will be sent, if requested

QUALITY COMPARISON

	SPECIFIED PRODUCT	SUBSTITUTION REQUEST
NAME, BRAND		
CATALOG NO.		
MANUFACTURER		
VENDOR		

PREVIOUS INSTALLATIONS

PROJECT	ARCHITECT/ENGINEER	
LOCATION		DATE INSTALLED

SIGNIFICANT VARIATIONS FROM SPECIFIED PRODUCT

REASON FOR SUBSTITUTION

DOES PROPOSED SUBSTITUTION AFFECT OTHER PARTS OF WORK?

☐ YES ☐ NO

IF YES, EXPLAIN

SUBSTITUTION REQUIRES DIMENSIONAL REVISION OR REDESIGN OF STRUCTURE OR A/E WORK

☐ YES ☐ NO

BIDDER'S/CONTRACTOR'S STATEMENT OF CONFORMANCE OF PROPOSED SUBSTITUTION TO CONTRACT REQUIREMENT:

We have investigated the proposed substitution. We believe that it is equal or superior in all respects to specified product, except as stated above; that it will provide the same Warranty as specified product; that we have included complete implications of the substitution; that we will pay redesign and other costs caused by the substitution which subsequently become apparent; and that we will pay costs to modify other parts of the Work as may be needed, to make all parts of the Work complete and functioning as a result of the substitution.

BIDDER/CONTRACTOR	DATE

REVIEW AND ACTION

☐ Resubmit Substitution Request with the following additional information:

☐ Substitution is accepted.

☐ Substitution is accepted with the following comments:

☐ Substitution is not accepted.

ARCHITECT/ENGINEER	DATE

STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

FINAL RECEIPT OF PAYMENT AND RELEASE

PROJECT NUMBER

KNOW ALL MEN BY THESE PRESENT THAT: hereinafter called "Subcontractor" who heretofore entered into an agreement with hereinafter called "Contractor", for the performance of work and/or furnishing of material for the construction of the project entitled

(PROJECT TITLE, PROJECT LOCATION, AND PROJECT NUMBER)

at

(ADDRESS OF PROJECT)

for the State of Missouri (Owner) which said subcontract is by this reference incorporated herein, in consideration of such final payment by Contractor.

DOES HEREBY:

1. ACKNOWLEDGE that they have been **PAID IN FULL** all sums due for work and materials contracted or done by their Subcontractors, Material Vendors, Equipment and Fixture Suppliers, Agents and Employees, or otherwise in the performance of the Work called for by the aforesaid Contract and all modifications or extras or additions thereto, for the construction of said project or otherwise.
2. RELEASE and fully, finally, and forever discharge the Owner from any and all suits, actions, claims, and demands for payment for work performed or materials supplied by Subcontractor in accordance with the requirements of the above referenced Contract.
1. REPRESENT that all of their Employees, Subcontractors, Material Vendors, Equipment and Fixture Suppliers, and everyone else has been **paid in full** all sums due them, or any of them, in connection with performance of said Work, or anything done or omitted by them, or any of them in connection with the construction of said improvements, or otherwise.

DATED this day of , 20 .

NAME OF SUBCONTRACTOR

BY (TYPED OR PRINTED NAME)

SIGNATURE

TITLE

ORIGINAL: FILE/Closeout Documents

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STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION

PAY APP NO.	PROJECT NUMBER
CHECK IF FINAL ☐**FINAL**	DATE

MBE/WBE/SDVE PROGRESS REPORT

Remit with **ALL** Progress and Final Payments

(Please check appropriate box) ☐CONSULTANT ☐CONSTRUCTION

PROJECT TITLE	
PROJECT LOCATION	
FIRM	
ORIGINAL CONTRACT SUM (Same as Line Item 1. on Form A of Application for Payment) **$**	TOTAL CONTRACT SUM TO DATE (Same as Line Item 3. on Form A of Application for Payment) **$**

THE TOTAL MBE/WBE/SDVE PARTICIPATION DOLLAR AMOUNT OF THIS PROJECT AS INDICATED IN THE ORIGINAL CONTRACT: **$**

SELECT MBE, WBE, SDVE	ORIGINAL CONTRACT PARTICIPATION AMOUNT	PARTICIPATION AMOUNT PAID-TO-DATE (includes approved contract changes)	CONSULTANT/SUBCONSULTANT OR CONTRACTOR/SUBCONTRACTOR/SUPPLIER COMPANY NAME
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	

Revised 06/2023

INSTRUCTIONS FOR MBE/WBE/SDVE PROGRESS REPORT

CONTRACTOR OR CONSULTANT TO FILL OUT AND REMIT WITH EACH PAY APPLICATION:

The MBE/WBE/SDVE Progress Report for the project is issued with the contract comprising values reported in the consultant's Proposal or on the successful contractor's Section 004337 Compliance Evaluation Forms.

At Initial Pay Application fill in the following:

1. Pay App No. Start with 1.
2. Fill in the Project Number and Date.
3. Enter Project Title, Project Location, and Firm.
4. Fill in the "Original Contract Sum" and "Total Contract Sum To Date" (Reference applicable Line Items on Form A of Application for Payment).
5. Indicate the Total Participation Dollar Amount from the Original Contract.
6. Select MBE, WBE, or SDVE for each Consultant/Subconsultant or Contractor/Subcontractor/Supplier.
7. Enter the "Total Amount of Subcontract", "$ Amount (Paid-To-Date)", and Company Name.

For all subsequent Pay Applications fill in the following:

1. Pay App No.
2. If Final Pay App, check box.
3. Fill in the Project Number and Date.
4. Enter Project Title, Project Location, and Firm
5. At each Pay App fill in the "Original Contract Sum" and "Total Contract Sum To Date" (reference applicable Line Items on Form A of Application for Payment).
6. Indicate the Total Participation Dollar Amount from the Original Contract.
7. Select MBE, WBE, or SDVE for each Consultant/Subconsultant or Contractor/Subcontractor/Supplier
8. Enter the "Total Amount of Subcontract", "$ Amount (Paid-To-Date)", and Company Name.

STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION
AFFIDAVIT – COMPLIANCE WITH PREVAILING WAGE LAW

PROJECT NUMBER

Before me, the undersigned Notary Public, in and for the County of _____

State of _____ personally came and appeared _____
(NAME)

_____ of the _____
(POSITION) (NAME OF THE COMPANY)

(a corporation) (a partnership) (a proprietorship) and after being duly sworn did depose and say that all provisions and requirements set out in Chapter 290, Sections 290.210 through and including 290.340, Missouri Revised Statutes, pertaining to the payment of wages to workmen employed on public works project have been fully satisfied and there has been no exception to the full and completed compliance with said provisions and requirements and with Wage Determination No: _____ issued by the Department of Labor and Industrial Relations, State of Missouri on the _____ day of _____ 20 __ in carrying out the contract and working in connection with _____
(NAME OF PROJECT)

Located at _____ in _____ County
(NAME OF THE INSTITUTION)

Missouri, and completed on the _____ day of _____ 20 __

SIGNATURE

NOTARY INFORMATION

NOTARY PUBLIC EMBOSSER OR BLACK INK RUBBER STAMP SEAL	STATE		COUNTY (OR CITY OF ST. LOUIS)
	SUBSCRIBED AND SWORN BEFORE ME, THIS DAY OF YEAR		**USE RUBBER STAMP IN CLEAR AREA BELOW**
	NOTARY PUBLIC SIGNATURE	MY COMMISSION EXPIRES	
	NOTARY PUBLIC NAME (TYPED OR PRINTED)		

FILE: Closeout Documents

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GENERAL CONDITIONS

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ARTICLE:

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5.4. Payments

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7. Termination or Suspension of Contract

7.1. For Site Conditions

7.2. For Cause

7.3. For Convenience

A. These General Conditions apply to each section of these specifications. The Contractor is subject to the provisions contained herein.

B. The General Conditions are intended to define the relationship of the Owner, the Designer and the Contractor thereby establishing certain rules and provisions governing the operation and performance of the work so that the work may be performed in a safe, orderly, expeditious and workmanlike manner.

ARTICLE 1 – GENERAL PROVISIONS

ARTICLE 1.1 - DEFINITIONS

As used in these contract documents, the following terms shall have the meanings and refer to the parties designated in these definitions.

1. **"COMMISSIONER":** The Commissioner of the Office of Administration.
2. **"CONSTRUCTION DOCUMENTS":** The "Construction Documents" shall consist of the Project Manual, Drawings and Addenda.
3. **"CONSTRUCTION REPRESENTATIVE:"** Whenever the term "Construction Representative" is used, it shall mean the Owner's Representative at the work site.
4. **"CONTRACTOR"**: Party or parties who have entered into a contract with the Owner to furnish work under these specifications and drawings.
5. **"DESIGNER"**: When the term "Designer" is used herein, it shall refer to the Architect, Engineer, or Consultant of Record specified and defined in Paragraph 2.0 of the Supplemental Conditions, or his duly authorized representative. The Designer may be either a consultant or state employee.
6. **"DIRECTOR"**: Whenever the term "Director" is used, it shall mean the Director of the Division of Facilities Management, Design and Construction or his Designee, representing the Office of Administration, State of Missouri. The Director is the agent of the Owner.
7. **"DIVISION":** Shall mean the Division of Facilities Management, Design and Construction, State of Missouri.
8. **"INCIDENTAL JOB BURDENS":** Shall mean those expenses relating to the cost of work, incurred either in the home office or on the job-site, which are necessary in the course of doing business but are incidental to the job. Such costs include office supplies and equipment, postage, courier services, telephone expenses including long distance, water and ice and other similar expenses.
9. **"JOINT VENTURE"**: An association of two (2) or more businesses to carry out a single business enterprise for profit for which purpose they combine their property, capital, efforts, skills and knowledge.
10. **"OWNER"**: Whenever the term "Owner" is used, it shall mean the State of Missouri. Acting by and through the Office of Administration, Division of Facilities Management, Design and Construction.
11. **"PROJECT"**: Wherever the term "Project" is used, it shall mean the work required to be completed by the construction contract.
12. **"PROJECT MANUAL"**: The "Project Manual" shall consist of Introductory Information, Invitation for Bid, Instructions to Bidders, Bid Documents, Additional Information, Standard Forms, General Conditions, Supplemental General Conditions, General Requirements and Technical Specifications.
13. **"SUBCONTRACTOR"**: Party or parties who contract under, or for the performance of part or this entire Contract between the Owner and Contractor. The subcontract may or may not be direct with the Contractor.
14. **"WORK"**: All supervision, labor, materials, tools, supplies, equipment, and any incidental operations and/or activities required by or reasonably inferable from the Contract Documents necessary to construct the Project and to produce the results intended by the Contract Documents in a safe, expeditious, orderly, and workmanlike manner so that the project shall be complete and finished in the best manner known to each respective trade.
15. "**WORKING DAYS**": are all calendar days except Saturdays, Sundays and the following holidays: New Year's Day, Martin Luther King, Jr. Day, Lincoln Day, Washington's Birthday (observed), Truman Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Veterans Day (observed), Thanksgiving Day, Christmas Day.

ARTICLE 1.2 DRAWINGS AND SPECIFICATIONS

A. In case of discrepancy between drawings and specifications, specifications shall govern. Should discrepancies in architectural drawings, structural drawings and mechanical drawings occur, architectural drawings shall govern and, in case of conflict between structural and mechanical drawings, structural drawings shall govern.

B. Specifications are separated into titled divisions for convenience of reference only and to facilitate letting of contracts and subcontracts. The Contractor is responsible for establishing the scope of work for subcontractors, which may cross titled divisions. Neither the Owner nor Designer will establish limits and jurisdiction of subcontracts.

C. Figured dimensions take precedence over scaled measurements and details over smaller scale general drawings. In the event of conflict between any of the documents contained within the contract, the documents shall take precedence and be controlling in the following sequence: addenda, supplementary general conditions, general conditions, division 1 specifications, technical division specifications, drawings, bid form and instructions to bidders.

D. Anything shown on drawings and not mentioned in these specifications or vice versa, as well as any incidental work which is obviously necessary to complete the project within the limits established by the drawings and specifications, although not shown on or described therein, shall be performed by the Contractor at no additional cost as a part of his contract.

E. Upon encountering conditions differing materially from those indicated in the contract documents, the Contractor shall promptly notify the Designer and Construction Representative in writing before such conditions are disturbed. The Designer shall promptly investigate said conditions and report to the Owner, with a recommended course of action**.** If conditions do materially differ and cause an increase or decrease in contract cost or time required for completion of any portion of the work, a contract change will be initiated as outlined in Article 4 of these General Conditions.

E. Only work included in the contract documents is authorized, and the Contractor shall do no work other than that described therein or in accordance with appropriately authorized and approved contract changes.

ARTICLE 1.3 - COMPLIANCE WITH LAWS, PERMITS, REGULATIONS AND INSPECTIONS

A. Since the Owner is the State of Missouri, municipal or political subdivisions, zoning ordinances, construction codes (other than licensing of trades), and other like ordinances are not applicable to construction on Owner's property, and Contractor will not be required to submit drawings and specifications to any municipal or political subdivision, authority, obtain construction permits or any other licenses (other than licensing of trades) or permits from or submit to inspections by any municipality or political subdivision relating to the construction for this project. All permits or licenses required by municipality or political subdivision for operation on property not belonging to Owner shall be obtained by and paid for by Contractor. Each Contractor shall comply with all applicable laws, ordinances, rules and regulations that pertain to the work of this contract.

B. Contractors, subcontractors and their employees engaged in the businesses of electrical, mechanical, plumbing, carpentry, sprinkler system work, and other construction related trades shall be licensed to perform such work by the municipal or political subdivision where the project is located, if such licensure is required by local code. Local codes shall dictate the level (master, journeyman, and apprentice) and the number, type and ratio of licensed tradesmen required for this project within the jurisdiction of such municipal or political subdivision.

C. Equipment and controls manufacturers and their authorized service and installation technicians that do not maintain an office within the jurisdiction of the municipal or political subdivision but are a listed or specified contractor or subcontractor on this project are exempt from Paragraph 1.3 B above.

D. The Contractor shall post a copy of the wage determination issued for the project and included as a part of the contract documents, in a prominent and easily accessible location at the site of construction for the duration of the project.

E. Any contractor or subcontractor to such contractor at any tier signing a contract to work on this project shall provide a ten-hour Occupational Safety and Health Administration (OSHA) construction safety program for their on-site employees which includes a course in construction safety and health approved by OSHA or a similar program approved by the Department of Labor and Industrial Relations which is at least as stringent as an approved OSHA program. The contractor shall forfeit as a penalty to the public body on whose

behalf the contract is made or awarded, two thousand five hundred dollars plus one hundred dollars for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training.

ARTICLE 1.4 - NONDISCRIMINATION IN EMPLOYMENT

A. The Contractor and his subcontractors will not discriminate against individuals based on race, color, religion, national origin, sex, disability, or age, but may use restrictions which relate to bona fide occupational qualifications. Specifically, the Contractor and his subcontractors shall not discriminate:

1. Against recipients of service on the basis of race, color, religion, national origin, sex, disability or age.
2. Against any employee or applicant, for employment on the basis of race, color, religion, national origin, sex or otherwise qualified disability status.
3. Against any applicant for employment or employee on the basis of age, where such applicant or employee is between ages 40 and 70 and where such Contractor employs at least 20 persons.
4. Against any applicant for employment or employee on the basis of that person's status as a disabled or Vietnam-era veteran.

The Contractor and his Subcontractors will ensure applicants for employment and employees are treated equally without regard to race, color, religion, national origin, sex, disability, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion and transfer; recruitment or recruitment advertising; and selection for training, including apprenticeship. The Contractor and his Subcontractors will give written notice of their commitments under this clause to any labor union with which they have bargaining or other agreements under this clause to any labor union with which they have bargaining or other agreements.

B. In the event of the Contractor's or his subcontractor's noncompliance with any provisions of this Article of the Contract, the Owner may cancel this contract in whole or in part or require the Contractor to terminate his contract with the subcontractor.

ARTICLE 1.5 - ANTI-KICKBACK

No employee of the division, shall have or acquire any pecuniary interest, whether direct or indirect, in this contract or in any part hereof. No officer, employee, designer, attorney, or administrator of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall have or acquire any pecuniary interest, whether direct or indirect, in this contract, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

ARTICLE 1.6 - PATENTS AND ROYALTIES

A. The Contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liabilities of any nature or kind, including cost and expenses, for, or on account of, any patented or unpatented invention, process, article or appliance manufactured or used in the performance of this contract, including its use by the Owner, unless otherwise specifically stipulated in the contract documents.

B. If the Contractor uses any design, device or materials covered by letters, patent or copyright, the Contractor shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood, without exception, that the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract and shall indemnify the Owner for any cost, expense or damage it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

ARTICLE 1.7 - PREFERENCE FOR AMERICAN AND MISSOURI PRODUCTS AND SERVICES

A. By virtue of statutory authority a preference will be given to Missouri labor and to products of mines, forests and quarries of the state of Missouri when they are found in marketable quantities in the state, and all such materials shall be of the best quality and suitable character that can be obtained at reasonable market prices, all as provided for in Section 8.280, Missouri Revised Statutes and Cumulative Supplements.

B. Furthermore, pursuant to Section 34.076 Missouri Revised Statutes and Cumulative Supplements, a preference shall be given to those persons doing business as Missouri firms, corporations, or individuals, or which maintain Missouri offices or places of business, when the quality of performance promised is equal or better and the price quoted is the same or less. In addition, in order for a non-domiciliary bidder to be successful, his bid must be that same percentage lower than a domiciliary Missouri bidder's bid, as would be required for a Missouri bidder to successfully bid in the non-domiciliary state.

C In accordance with the Missouri Domestic Products Procurement Act Section 34.350 RSMo and Cumulative Supplements any manufactured goods or commodities used or supplied in the performance of this contract or any subcontract thereto shall be manufactured, assembled or produced in the United States, unless the specified products are not manufactured, assembled or produced in the United States in sufficient quantities to meet the agency's requirements or cannot be manufactured, assembled or produced in the United States within the necessary time in sufficient quantities to meet the contract requirements, or if obtaining the specified products manufactured, assembled or produced in the United States would increase the cost of this contract for purchase of the product by more than ten percent.

ARTICLE 1.8 - COMMUNICATIONS

A. All notices, requests, instructions, approvals, and claims must be in writing and shall be delivered to the Designer and copied to the Construction Representative for the project except as required by Article 1.12 Disputes and Disagreements, or as otherwise specified by the Owner in writing as stated in Section 012600. Any such notice shall be deemed to have been given as of the time of actual receipt.

B. The Contractor shall attend on-site progress and coordination meetings, as scheduled by the Construction Representative, no less than once a month.

C. The Contractor shall ensure that major subcontractors and suppliers shall attend monthly progress meetings as necessary to coordinate the work, and as specifically requested by the Construction Representative.

ARTICLE 1.9 - SEPARATE CONTRACTS AND COOPERATION

A. The Owner reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs.

B. The Contractor shall consult the drawings for all other contractors in connection with this work. Any work conflicting with the above shall be brought to the attention of the Owner’s Representative before the work is performed. If the Contractor fails to do this, and constructs any work which interferes with the work of another contractor, the Contractor shall remove any part so conflicting and rebuild same, as directed by the Owner’s Representative at no additional cost to the Owner.

C. Each contractor shall be required to coordinate his work with other contractors so as to afford others reasonable opportunity for execution of their work. No contractor shall delay any other contractor by neglecting to perform contract work at the proper time. If any contractor causes delay to another, they shall be liable directly to that contractor for such delay in addition to any liquidated damages which might be due the Owner.

D. Should the Contractor or project associated subcontractors refuse to cooperate with the instructions and reasonable requests of other Contractors or other subcontractors in the overall coordinating of the work, the Owner may take such appropriate action and issue directions, as required, to avoid unnecessary and unwarranted delays.

E. Each Contractor shall be responsible for damage done to Owner's or other Contractor's property by him/her or workers in his employ through their fault or negligence.

F. Should a Contractor sustain any damage through any act or omission of any other Contractor having a contract with the Owner, the Contractor so damaged shall have no claim or cause of action against the Owner for such damage, but shall have a claim or cause of action against the other Contractor to recover any and all damages sustained by reason of the acts or omissions of such Contractor. The phrase "acts or omissions" as used in this section shall be defined to include, but

not be limited to, any unreasonable delay on the part of any such contractors.

ARTICLE 1.10 - ASSIGNMENT OF CONTRACT

A. No assignment by Contractor of any amount or any part of this contract or of the funds to be received there under will be recognized unless such assignment has had the written approval of the Director and the surety has been given due notice of such assignment and has furnished written consent thereto. In addition to the usual recitals in assignment contracts, the following language must be set forth: "It is agreed that the funds to be paid to the assignee under this assignment are subject to performance by the Contractor of this contract and to claims or liens for services rendered or materials supplied for the performance of the work called for in said contract in favor of all persons, firms or corporations rendering such services or supplying such materials."

ARTICLE 1.11 - INDEMNIFICATION

A. Contractor agrees to indemnify and save harmless Owner and its respective commissioners, officers, officials, agents, consultants and employees and Designer, their agents, servants and employees, from and against any and all liability for damage arising from injuries to persons or damage to property occasioned by any acts or omissions of Contractor, any subcontractors, agents, servants or employees, including any and all expense, legal or otherwise, which may be incurred by Owner or Designer, its agents, servants or employees, in defense of any claim, action or suit.

B. The obligations of the Contractor under this paragraph shall not extend to the liability of the Designer, his agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, contract changes, design or specifications, or (2) giving of or the failure to give directions or instructions by the Designer, his agents or employees as required by this contract documents provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 1.12 - DISPUTES AND DISAGREEMENTS

It is hereby expressly agreed and understood that in case any controversy or difference of opinion arises during construction, best efforts will be given to resolution at the field level. Should those efforts be unsuccessful, the Contractor has the right to appeal in writing, the decision of the Director's Designee to the Director at Room 730 Truman Building, P.O. Box 809, Jefferson City, Missouri 65102. The decision of the Director shall be final and binding on all parties.

ARTICLE 2 -- OWNER/DESIGNER RESPONSIBILITIES

A. The Owner shall give all orders and directions contemplated under this contract relative to the execution of the work. During progress of work the Owner will be represented at the project site by the Construction Representative and/or Designer, whose responsibilities are to see that this contract is properly fulfilled.

B. The Owner shall at all times have access to the work whenever it is in preparation or progress. The Contractors shall provide proper facilities for such access and for inspection and supervision.

C. All materials and workmanship used in the work shall be subject to the inspection of the Designer and Construction Representative, and any work which is deemed defective shall be removed, rebuilt or made good immediately upon notice. The cost of such correction shall be borne by the Contractor. Contractor shall not be entitled to an extension of the contract completion date in order to remedy defective work. All rejected materials shall be immediately removed from the site of the work.

D. If the Contractor fails to proceed at once with the correction of rejected defective materials or workmanship, the Owner may, by separate contract or otherwise, have the defects remedied or rejected. Materials removed from the site and charge the cost of the same against any monies which may be due the Contractor, without prejudice to any other rights or remedies of the Owner.

E. Failure or neglect on the part of Owner to observe faulty work, or work done which is not in accordance with the drawings and specifications shall not relieve the Contractor from responsibility for correcting such work without additional compensation.

F. The Owner shall have the right to direct the Contractor to uncover any completed work.

1. If the Contractor fails to adequately notify the Construction Representative and/or Designer of an inspection as required by the Contract Documents, the Contractor shall, upon written request, uncover the work. The Contractor shall bear all costs associated with uncovering and again covering the work exposed.

2. If the Contractor is directed to uncover work, which was not otherwise required by the Contract Documents to be inspected, and the work is found to be defective in any respect, no compensation shall be allowed for this work. If, however, such work is found to meet

the requirements of this contract, the actual cost of labor and material necessarily involved in the examination and replacement plus 10% shall be allowed the Contractor.

G. The Designer shall give all orders and directions contemplated under this contract relative to the scope of the work and shall give the initial interpretation of the contract documents.

H. The Owner may file a written notice to the Contractor to dismiss immediately any subcontractors, project managers, superintendents, foremen, workers, watchmen or other employees whom the Owner may deem incompetent, careless or a hindrance to proper or timely execution of the work. The Contractor shall comply with such notice as promptly as practicable without detriment to the work or its progress.

I. If in the Owner's judgment it becomes necessary at any time to accelerate work, when ordered by the Owner in writing, the Contractor shall redirect resources to such work items and execute such portions of the work as may be required to complete the work within the current approved contract schedule.

ARTICLE 3 -- CONTRACTOR RESPONSIBILITIES

The Contractor shall register and utilize the Owner's eBuilder digital project management system for submission of documents described in the following sections. This includes but is not limited to submittals as required by designer, payment applications, Request for Information (RFI), construction change orders, Request for Proposals (RFP), Designer Supplemental Instructions (DSI), etc.

ARTICLE 3.1 -- ACCEPTABLE SUBSTITUTIONS

A. The Contractor may request use of any article, device, product, material, fixture, form or type of construction which in the judgment of the Owner and Designer is equal in all respects to that named. Standard products of manufacturers other than those specified will be accepted when, prior to the ordering or use thereof, it is proven to the satisfaction of the Owner and Designer that they are equal in design, strength, durability, usefulness and convenience for the purpose intended.

B. Any changes required in the details and dimensions indicated on the drawings for the substitution of products other than those specified shall be properly made at the expense of the Contractor requesting the substitution or change.

C. The Contractor shall submit a request for such substitutions in writing to the Owner and Designer within twenty (20) working days after the date of the "Notice to Proceed." Thereafter no consideration will be given to alternate forms of accomplishing the work. This Article does not preclude the Owner from exercising the provisions of Article 4 hereof.

D. Any request for substitution by the Contractor shall be submitted in accordance with SECTION 002113 - INSTRUCTIONS TO BIDDERS.

E. When a material has been approved, no change in brand or make will be permitted unless:

1. Written verification is received from the manufacturer stating they cannot make delivery on the date previously agreed, or
2. Material delivered fails to comply with contract requirements.

ARTICLE 3.2 -- SUBMITTALS

A. The Contractor's submittals must be submitted with such promptness as to allow for review and approval so as not to cause delay in the work. The Contractor shall coordinate preparation and processing of submittals with performance of construction activities.

Coordinate each submittal with fabrication, = purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

Submit four (4) copies to the Designer and additional copies as required for the subcontractors and material suppliers. Also provide copies to meet the requirements for maintenance manuals.

B. All subcontractors' shop drawings and schedules shall be submitted by the Contractor and shall bear evidence that Contractor has received, reviewed, and approved them. Any shop drawings and schedules submitted without this evidence will be returned to the Contractor for resubmission.

C. The Contractor shall include with the shop drawing, a letter indicating any and all deviations from the drawings and/or specifications. Failure to notify the Designer of such deviations will be grounds for subsequent rejection of the related work or materials. If, in the opinion of the Designer, the deviations are not acceptable, the Contractor will be required to furnish the item as specified and indicated on the drawings.

D. The Designer shall check shop drawings and schedules with reasonable promptness and approve them only if they conform to the design concept of the project and comply with the information given in the contract documents. The approval shall not relieve the Contractor from the responsibility to comply with the drawings and specifications, unless the Contractor has called the Designer's attention to the deviation, in writing, at the time of

submission and the Designer has knowingly approved thereof. An approval of any such modification will be given only under the following conditions:

1. It is in the best interest of the Owner
2. It does not increase the contract sum and/or completion time
3. It does not deviate from the design intent
4. It is without prejudice to any and all rights under the surety bond.

E. No extension of time will be granted because of the Contractor's failure to submit shop drawings and schedules in ample time to allow for review, possible resubmission, and approval. Fabrication of work shall not commence until the Contractor has received approval. The Contractor shall furnish prints of approved shop drawings and schedules to all subcontractors whose work is in any way related to the work under this contract. Only prints bearing this approval will be allowed on the site of construction

F. The Contractor shall maintain a complete file on-site of approved shop drawings available for use by the Construction Representative.

ARTICLE 3.3 – AS-BUILT DRAWINGS

A. The Contractor shall update a complete set of the construction drawings, shop drawings and schedules of all work monthly by marking changes, and at the completion of their work (prior to submission of request for final payment) note all changes and turn the set over to the Construction Representative. The updates shall show all addenda, all field changes that were made to adapt to field conditions, changes resulting from contract changes or supplemental instructions, and all locations of structures, buried installations of piping, conduit, and utility services. All buried and concealed items both inside and outside shall be accurately located as to depth and referenced to permanent features such as interior or exterior wall faces and dimensions shall be given in a neat and legible manner in a contrasting colored pencil or ink. If approved by the Designer, an electronic file format may be provided.

ARTICLE 3.4 – GUARANTY AND WARRANTIES

A. General Guaranty

1. Neither the final certificate of payment nor any provision in the contract documents nor partial use or occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with contract requirements.
2. The Contractor or surety shall remedy any defects in the work and pay for any damage to property resulting there from which shall appear within a period of one (1) year from the date of substantial completion unless a longer period is otherwise specified or a differing guaranty period has been established in the substantial completion certificate. The Owner will give notice of observed defects with reasonable promptness.
3. In case of default on the part of the Contractor in fulfilling this part of this contract, the Owner may correct the work or repair the damage and the cost and expense incurred in such event shall be paid by or recoverable from the Contractor or surety.
4. The work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's guaranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment

B. Extended Warranty

Manufacturer's certificates of warranty shall be obtained for all major equipment. Warranty shall be obtained for at least one year. Where a longer period is offered at no additional cost or called for in the specific equipment specifications, the longer period shall govern.

ARTICLE 3.5 -- OPERATION AND MAINTENANCE MANUALS

A. Immediately after equipment submittals are approved and no later than ten (10) working days prior to the substantial completion inspection, the Contractor shall provide to the Designer three (3) copies of operating instructions and service manuals, containing the following:

1. Start-up and Shut-down Procedures: Provide a step-by-step write up of all major equipment. When manufacturer’s printed start-up, trouble shooting and shut-down procedures are available; they may be incorporated into the operating manual for reference.

2. Operating Instructions: Written operating instructions shall be included for the efficient and safe operation of all equipment.

3. Equipment List: List of all major equipment as installed shall be prepared to include model number, capacities, flow rate, name place data, shop drawings and air and water balance reports.

4. Service Instructions: Provide the following information for all pieces of equipment.

   a. Recommended spare parts including catalog number and name of local supplier or factory representative.

   b. Belt sizes, types, and lengths.

   c. Wiring diagrams.

5. Manufacturer's Certificate of Warranty as described in Article 3.4.

6. Prior to the final payment, furnish to the Designer three (4) copies of parts catalogs for each piece of equipment furnished by him/her on the project with the components identified by number for replacement ordering.

B. Submission of operating instructions shall be done in the following manner.

1. Manuals shall be in quadruplicate, and all materials shall be bound into volumes of standard 8½" x 11" hard binders. Large drawings too bulky to be folded into 8½" x 11" shall be separately bound or folded and in envelopes, cross referenced and indexed with the manuals.

2. The manuals shall identify project name, project number, and include the name and address of the Contractor, subcontractors and manufacturers who were involved with the activity described in that particular manual.

3. Internally subdivide the binder contents with permanent page dividers, logically organized with tab titles clearly printed under reinforced laminated plastic tabs.

4. Contents: Prepare a Table of Contents for each volume, with each product or system description identified.

ARTICLE 3.6 – OTHER CONTRACTOR RESPONSIBILITIES

A. The Contractor shall keep on site, during progress of the work, a competent superintendent satisfactory to the Construction Representative. The superintendent shall represent the Contractor and all agreements made by the superintendent shall be binding. The superintendent shall carefully study and compare all drawings, specifications and other instructions and shall promptly notify the Construction Representative and Designer, in writing, any error, inconsistency or omission which may be discovered. The superintendent shall coordinate all work on the project. Any change of the superintendent shall be approved by the Construction Representative.

B. Contractor shall, at all times, enforce strict discipline and good order among his employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him/her.

C. The Contractor shall supply sufficient labor, material, plant and equipment and pay when due any laborer, subcontractor or supplier for supplies furnished and otherwise prosecute the work with diligence to prevent work stoppage and ensure completion thereof within the time specified.

D. The Contractor and each of his subcontractors shall submit to the Construction Representative, through the Designer such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.

E. The Contractor, subcontractors, and material suppliers shall upon written request, give the Owner access to all time cards, material invoices, payrolls, estimates, profit and loss statements, and all other direct or indirect costs related to this work.

F. The Contractor shall be responsible for laying out all contract work such as layout of architectural, structural, mechanical and electrical work, which shall be coordinated with layouts of subcontractors for general construction work. The Contractor is also responsible for unloading, uncrating and handling of all materials and equipment to be erected or placed by him/her, whether furnished by Contractor or others. No extra charges or compensation will be allowed as a result of failure to verify dimensions before ordering materials or fabricating items.

G. The Contractor must notify the Construction Representative at least one working day before placing concrete or burying underground utilities, pipelines, etc.

H. Contractors shall prearrange time with the Construction Representative for the interruption of any facility operation. Unless otherwise specified in these documents, all connections, alterations or relocations as well as all other portions of the work will be performed during normal working hours.

I. The Contractor shall coordinate all work so there will not be prolonged interruptions of existing equipment operation. Any existing plumbing, heating, ventilating, air conditioning or electrical disconnections necessary for the project, which affect portions of this construction or building or any other building must be scheduled with the Construction Representative to minimize or avoid any disruption of facility operations. In no case, unless previously approved in writing by the Construction Representative, shall utilities be left disconnected at the end of a work day or over a weekend. Any interruption of utilities either intentionally or accidentally shall not relieve the Contractor responsible for the interruption from the responsibility to repair and restore the utility to normal service. Repairs and restoration shall be made before the workers responsible for the repair and restoration leave the job.

J. Contractors shall limit operations and storage of materials to the area within the project, except as necessary to connect to existing utilities, and shall not encroach on neighboring property. The Contractor shall be responsible for repair of their damage to property on or off the project site occurring during construction of project. All such repairs shall be made to the satisfaction of the property owner.

K. Unless otherwise permitted, all materials shall be new and both workmanship and materials shall be of the best quality.

L. Unless otherwise provided and stipulated within these specifications, the Contractor shall furnish, construct, and/or install and pay for materials, devices, mechanisms, equipment, all necessary personnel, utilities including, but not limited to water, heat, light and electric power, transportation services, applicable taxes of every nature, and all other facilities necessary for the proper execution and completion of the work.

M. Contractor shall carefully examine the plans and drawings and shall be responsible for the proper fitting of his material, equipment and apparatus into the building.

N. The Contractor or subcontractors shall not overload, or permit others to overload, any part of any structure during the performance of this contract.

O. All temporary shoring, bracing, etc., required for the removal of existing work and/or for the installation of new work shall be included in this contract. The Contractor shall make good, at no cost to the Owner, any damage caused by improper support or failure of shoring in any respect. Each Contractor shall be responsible for shoring required to protect his work or adjacent property and improvements of Owner and shall be responsible for shoring or for giving written notice to adjacent property owners. Shoring shall be removed only after completion of permanent supports.

P. The Contractor shall provide at the proper time such material as is required for support of the work. If openings are required, whether shown on drawings or not, the Contractor shall see that they are properly constructed.

Q. During the performance of work the Contractor shall be responsible for providing and maintaining warning signs, lights, signal devices, barricades, guard rails, fences and other devices appropriately located on site which will give proper and understandable warning to all persons of danger of entry onto land, structure or equipment.

R. The Contractor shall be responsible for protection, including weather protection, and proper maintenance of all equipment and materials.

S. The Contractor shall be responsible for care of the finished work and shall protect same from damage or defacement until substantial completion by the Owner. If the work is damaged by any cause, the Contractor shall immediately begin to make repairs in accordance with the drawings and specifications. Contractor shall be liable for all damage or loss unless attributable to the acts or omissions of the Owner or Designer. Any claim for reimbursement shall be submitted in accordance with Article 4. After substantial completion the Contractor will only be responsible for damage resulting from acts or omissions of the Contractor or subcontractors through final warranty.

T. In the event the Contractor encounters an unforeseen hazardous material, the Contractor shall immediately stop work in the area affected and report the condition to the Owner and Designer in writing. The Contractor shall not be required, pursuant to Article 4, to perform, any work relating to hazardous materials.

U. 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 4.

V. Before commencing work, Contractors shall confer with the Construction Representative and facility representative and review any facility rules and regulations which may affect the conduct of the work.

W. Project signs will only be erected on major projects and only as described in the specifications. If no sign is specified, none shall be erected.

ARTICLE 3.7 -- SUBCONTRACTS

A. Subcontractor assignments as identified in the bid form shall not be changed without written approval of the Owner. The Owner will not approve changes of a listed subcontractor unless the Contractor documents, to the satisfaction of the Owner that the subcontractor cannot or will not perform the work as specified.

B. The Contractor is fully responsible to the Owner for the acts and omissions of all subcontractors and of persons either directly or indirectly employed by them.

C. Every subcontractor shall be bound by the applicable terms and provisions of these contract documents, but no contractual relationship shall exist between any subcontractor and the Owner unless the right of the Contractor to proceed with the work is suspended or this contract is terminated as herein provided, and the Owner in writing elects to assume the subcontract.

D. The Contractor shall upon receipt of "Notice to Proceed" and prior to submission of the first payment request, notify the Designer and Construction Representative in writing of the names of any subcontractors to be used in addition to those identified in the bid form and all major material suppliers proposed for all parts of the work.

ARTICLE 4 -- CHANGES IN THE WORK

4.1 CHANGES IN THE WORK

A. The Construction Representative, without giving notice to the surety and without invalidating this contract, may order extra work or make changes by altering, adding to or deducting from the work, this contract sum being adjusted accordingly. All such work shall be executed under the conditions of the original contract. A claim for extension of time caused by any change must be adjusted at the time of ordering such change. No future request for time will be considered.

B. Each Contract Change shall include all costs required to perform the work including all labor, material, equipment, overheads and profit, delay, disruptions, or other miscellaneous expenses. No subsequent requests for additional compensation including claims for delay, disruption, or reduced efficiency as a result of each change will be considered. Values from the Schedule of Values will not be binding as a basis for additions to or deductions from the contract price.

C. The amount of any adjustment in this contract price for authorized changes shall be agreed upon before such changes become effective and shall be determined, through submission of a request for proposal, as follows:

1. By an acceptable fixed price proposal from the Contractor. Breakdowns shall include all takeoff sheets of each Contractor and subcontractor. Breakdown shall include a listing of each item of material with unit prices and number of hours of labor for each task. Labor costs per hour shall be included with labor burden identified, which shall be not less than the prevailing wage rate, etc. Overhead and profit shall be shown separately for each subcontractor and the Contractor.

2. By a cost-plus-fixed-fee (time and material) basis with maximum price, total cost not to exceed said maximum. Breakdown shall include a listing of each item of material with unit prices and number of hours of labor for each task. Labor costs per hour shall be included with labor burden identified, which shall be not less than the prevailing wage rate, etc. Overhead and profit shall be shown separately for each subcontractor and the Contractor.

3. By unit prices contained in Contractor's original bid form and incorporated in the construction contract.

D. Overhead and Profit on Contract Changes shall be applied as follows:

1. The overhead and profit charge by the Contractor and all subcontractors shall be considered to include, but is not limited to: incidental job burdens, small truck (under 1 ton) expense, mileage, small hand tools, warranty costs, company benefits and general office overhead. Project supervision including field supervision and job site office expense shall be considered a part of overhead and profit unless a compensable time extension is granted.

2. The percentages for overhead and profit charged on Contract Changes shall be subject to the following limits: (a) the percentage mark-up for the Contractor shall be limited to the Contractor’s fee: (b) fifteen percent (15%) maximum for Work directly performed by employees of a subcontractor, or sub-subcontractor; (c) five percent (5%) maximum for the Work performed or passed through to the Owner by the Contractor; (d) five percent (5%) maximum subcontractor’s mark-up for

Work performed by a sub-subcontractor and passed through to the Owner by the subcontractor and Contractor; and (e) in no case shall the total overhead and profit paid by the Owner on any Contract Changes exceed twenty-five percent (25%) of the cost of materials, labor and equipment (exclusive of Contractor or any Subcontractor overhead and profit) necessary to put the contract change work in place.

3. The Contractor will be allowed to add the cost of Contractor's payment and performance bonding, builder's risk insurance, and general liability insurance to their cost of work. The above listed bonding and insurance cost shall not exceed two percent (2%) and shall be allowed on the total cost of the added work, including overhead and profit.

4. On proposals covering both increases and decreases in the amount of this contract, the application of overhead and profit shall be on the net change in the cost of the work.

5. The percentage(s) for overhead and profit to be credited to the Owner on Contract Changes that are solely decreases in the quantity of work or materials shall be the same as those for additive Contract Changes provided above.

E. No claim for an addition to this contract sum shall be valid unless authorized as aforesaid in writing by the Owner. In the event that none of the foregoing methods are agreed upon, the Owner may order the Contractor to perform work on a time and material basis. The cost of such work shall be determined by the Contractor's actual labor and material cost to perform the work plus overhead and profit as outlined herein. The Designer and Construction Representative shall approve the Contractor's daily time and material invoices for the work involved.

F. If the Contractor claims that any instructions involve extra cost under this contract, the Contractor shall give the Owner's Representative written notice thereof within a reasonable time after the receipt of such instructions, and in any event before proceeding to execute the work. No such claim shall be valid unless so made and authorized by the Owner, in writing.

G. In an emergency affecting the safety of life or of the structure or of adjoining property, the Contractor, without special instruction or authorization from the Construction Representative, is hereby permitted to act at their discretion to prevent such threatened loss or injury. The Contractor shall submit a claim for compensation for such emergency work in writing to the Owner's Representative.

ARTICLE 4.2 – CHANGES IN COMPLETION TIME

A. Extension of the number of work days stipulated in the Contract for completion of the work with compensation may be made when:

1. The contractor documents that proposed Changes in the work, as provided in Article 4.1, extends construction activities critical to contract completion date, OR

2. The Owner suspends all work for convenience of the Owner as provided in Article 7.3, OR

3. An Owner caused delay extends construction activities critical to contract completion (except as provided elsewhere in these General Conditions). The Contractor is to review the work activities yet to begin and evaluate the possibility of rescheduling the work to minimize the overall project delay.

B. Extension of the number of work days stipulated in the Contract for completion of the work <u>without</u> compensation may be made when:

1. Weather-related delays occur, subject to provisions for the inclusion of a specified number of "bad weather" days when provided for in Section 012100-Allowances, OR

2. Labor strikes or acts of God occur, OR

3. The work of the Contractor is delayed on account of conditions which were beyond the control of the Contractor, subcontractors or suppliers, and were not the result of their fault or negligence.

C. No time extension or compensation will be provided for delays caused by or within the control of the Contractor, subcontractors or suppliers and for concurrent delays caused by the Owner.

D. The Contractor shall notify the Owner promptly of any occurrence or conditions which in the Contractor's opinion results in a need for an extension of time. The notice shall be in writing and shall include all necessary supporting materials with details of any resultant costs and be submitted in time to permit full investigation and evaluation of the Contractor's claim. The Owner shall promptly acknowledge the Contractor's notice and, after recommendation from the Owner's Representative and/or Designer, shall provide a decision to the Contractor. Failure on the part of the Contractor to provide such notice and to detail the costs shall constitute a waiver by the Contractor of any claim. Requests for extensions of time shall be for working days only.

ARTICLE 5 - CONSTRUCTION AND COMPLETION

ARTICLE 5.1 – CONSTRUCTION COMMENCEMENT

A. Upon receipt of the "Intent to Award" letter, the Contractor must submit the following properly executed instruments to the Owner:

1. Contract;
2. Performance/payment bond as described in Article 6.1;
3. Certificates of Insurance, or the actual policies themselves, showing that the Contractor has obtained the insurance coverage required by Article 6.2.

Above referenced items must be received by the Owner within ten (10) working days after the effective date of the contract. If not received, the Owner may treat the failure to timely submit them as a refusal by the Contractor to accept a contract for this work and may retain as liquidated damages the Contractor's bid bond, cashier's check or certified check as provided in the Instructions to Bidders. Upon receipt the Owner will issue a "Notice to Proceed" with the work to the Contractor.

B. Within the time frame noted in Section 013200 - Schedules, following receipt of the "Notice to Proceed", the Contractor shall submit to the Owner a progress schedule and schedule of values, showing activities through the end of the contract period. Should the Contractor not receive written notification from the Owner of the disapproval of the schedule of values within fifteen (15) working days, the Contractor may consider it approved for purpose of determining when the first monthly Application and Certification for Payment may be submitted.

C. The Contractor may commence work upon receipt of the Division of Facilities Management, Design and Construction's "Notice to Proceed" letter. Contractor shall prosecute the work with faithfulness and energy, and shall complete the entire work on or before the completion time stated in the contract documents or pay to the Owner the damages resulting from the failure to timely complete the work as set out within Article 5.4.

ARTICLE 5.2 -- PROJECT CONSTRUCTION

A. Each Contractor shall submit for the Owner's approval, in reproducible form, a progress schedule showing the rate of progress and the order of the work proposed to carry on various phases of the project. The schedule shall be in conformance with the requirements outlined in Section 013200 – Schedules.

B. Contractor shall employ and supply a sufficient force of workers, material, and equipment and shall pay when due, any worker, subcontractor or supplier and otherwise prosecute the work with such diligence so as to maintain the rate of progress indicated on the progress schedule, prevent work stoppage, and insure completion of the project within the time specified.

ARTICLE 5.3 -- PROJECT COMPLETION

A. Substantial Completion. A Project is substantially complete when construction is essentially complete and work items remaining to be completed can be done without interfering with the Owner's ability to use the Project for its intended purpose.

1. Once the Contractor has reached what they believe is Substantial Completion, the Contractor shall notify the Designer and the Construction Representative of the following:
   a. That work is essentially complete with the exception of certain listed work items. The list shall be referred to as the "Contractor's Punch."
   b. That all Operation and Maintenance Manuals have been assembled and submitted in accordance with Article 3.5A.
   c. That the Work is ready for inspection by the Designer and Construction Representative. The Owner shall be entitled to a minimum of ten working days notice before the inspection shall be performed.
2. If the work is acceptable, the Owner shall issue a Certificate of Substantial Completion, which shall set forth the responsibilities of the Owner and the Contractor for utilities, security, maintenance, damage to the work and risk of loss. The Certificate shall also identify those remaining items of work to be performed by the Contractor. All such work items shall be complete within 30 working days of the date of the Certificate, unless the Certificate specifies a different time. If the Contractor shall be required to perform tests that must be delayed due to climatic conditions, it is understood that such tests and affected equipment will be identified on the Certificate and shall be accomplished by the Contractor at the earliest possible date. Performance of the tests may not be required before Substantial Completion can be issued. The date of the issuance of the Certificate of

Substantial Completion shall determine whether or not the work was completed within the contract time and whether or not Liquidated Damages are due.

3. If the work is not acceptable, and the Owner does not issue a Certificate of Substantial Completion, the Owner shall be entitled to charge the Contractor with the Designer's and Owner's costs of re-inspection, including time and travel.

B. Partial Occupancy. Contractor agrees that the Owner shall be permitted to occupy and use any completed or partially completed portions of the Project, when such occupancy and use is in the Owner's best interest. Owner shall notify Contractor of its desire and intention to take Partial Occupancy as soon as possible but at least ten (10) working days before the Owner intends to occupy. If the Contractor believes that the portion of the work the Owner intends to occupy is not ready for occupancy, the Contractor shall notify the Owner immediately. The Designer shall inspect the work in accordance with the procedures above. If the Contractor claims increased cost of the project or delay in completion as a result of the occupancy, he shall notify the Owner immediately but in all cases before occupancy occurs.

C. Final Completion. The Project is finally complete when the Certificate of Substantial Completion has been issued and all work items identified therein as incomplete have been completed, and when all administrative items required by the contract have been completed. Final Completion entitles the Contractor to payment of the outstanding balance of the contract amount including all change orders and retainage. Within five (5) working days of the date of the Certificate of Substantial Completion, the Contractor shall identify the cost to complete any outstanding items of work. The Designer shall review the Contractor's estimate and either approve it or provide an independent estimate for all such items. If the Contractor fails to complete the remaining items within the time specified in the Certificate, the Owner may terminate the contract and go to the surety for project completion in accordance with Article 7.2 or release the contract balance to the Contractor less 150% of the approved estimate to complete the outstanding items. Upon completion of the outstanding items, when a final cost has been established, any monies remaining shall be paid to the Contractor. Failure to complete items of work does not relieve the Contractor from the obligation to complete the administrative requirements of the contract, such as the provisions of Article 5.3 FAILURE TO COMPLETE ALL ITEMS OF WORK UNDER THE CONTRACT SHALL BE CONSIDERED A DEFAULT AND BE GROUNDS FOR CONTRACT TERMINATION AND DEBARMENT.

D. Liquidated Damages. Contractor agrees that the Owner may deduct from the contract price and retain as liquidated damages, and not as penalty or forfeiture, the sum stipulated in this contract for each work day after the Contract Completion Day on which work is not Substantially Complete. Assessment of Liquidated Damages shall not relieve the Contractor or the surety of any responsibility or obligation under the Contract. In addition, the Owner may, without prejudice to any other rights, claims, or remedies the Owner may have including the right to Liquidated Damages, charge the Contractor for all additional expenses incurred by the Owner and/or Designer as the result of the extended contract period through Final Completion. Additional Expenses shall include but not be limited to the costs of additional inspections.

E. Early Completion. The Contractor has the right to finish the work before the contract completion date; however, the Owner assumes no liability for any hindrances to the Contractor unless Owner caused delays result in a time extension to the contract completion date. The Contractor shall not be entitled to any claims for lost efficiencies or for delay if a Certificate of Substantial Completion is given on or before the Contract Completion Date.

ARTICLE 5.4 -- PAYMENT TO CONTRACTOR

A. Payments on account of this contract will be made monthly in proportion to the work which has been completed. Request for payment must be submitted on the Owner's forms. No other pay request will be processed. Supporting breakdowns must be in the same format as Owner's forms and must provide the same level of detail. The Designer will, within 5 working days from receipt of the contractor's request for payment either issue a Certificate for Payment to the Owner, for such amount as the Designer determines is properly due, or notify the Contractor in writing of reasons for withholding a Certificate. The Owner shall make payment within 30 calendar days after the "Application and Certification for Payment" has been received and certified by the Designer. The following items are to be attached to the contractor's pay request:

1. Updated construction schedule
2. Certified payrolls consisting of name, occupation and craft, number of hours worked and actual wages paid for each individual employee, of the Contractor and all subcontractors working on the project

B. The Owner shall retain 5 percent of the amount of each such payment application, except as allowed by Article 5.4, until final completion and acceptance of all work covered by this contract.

C. Each payment made to Contractor shall be on account of the total amount payable to Contractor and all material and work covered by paid partial payment shall thereupon become the sole property of Owner. This provision shall not be construed as relieving Contractor from sole responsibility for care and protection of materials and work upon which payments have been made or restoration of any damaged work or as a waiver of the right of Owner to require fulfillment of all terms of this contract.

D. Materials delivered to the work site and not incorporated in the work will be allowed in the Application and Certification for Payment on the basis of one hundred (100%) percent of value, subject to the 5% retainage providing that they are suitably stored on the site or in an approved warehouse in accordance with the following requirements:

1. Material has previously been approved through submittal and acceptance of shop drawings conforming to requirements of Article 3.2 of General Conditions.

2. Delivery is made in accordance with the time frame on the approved schedule.

3. Materials, equipment, etc., are properly stored and protected from damage and deterioration and remain so - if not, previously approved amounts will be deleted from subsequent pay applications.

4. The payment request is accompanied by a breakdown identifying the material equipment, etc. in sufficient detail to establish quantity and value.

E. The Contractor shall be allowed to include in the Application and Certification for Payment, one hundred (100%) of the value, subject to retainage, of major equipment and material stored off the site if all of the following conditions are met:

1. The request for consideration of payment for materials stored off site is made at least 15 working days prior to submittal of the Application for Payment including such material. Only materials inspected will be considered for inclusion on Application for Payment requests.

2. Materials stored in one location off site are valued in excess of $25,000.

3. That a Certificate of Insurance is provided indicating adequate protection from loss, theft conversion or damage for materials stored off site. This Certificate shall show the State of Missouri as an additional insured for this loss.

4. The materials are stored in a facility approved and inspected, by the Construction Representative.

5. Contractor shall be responsible for, Owner costs to inspect out of state facilities, and any delays in the completion of the work caused by damage to the material or for any other failure of the Contractor to have access to this material for the execution of the work.

F. The Owner shall determine the amount, quality and acceptability of the work and materials which are to be paid for under this contract. In the event any questions shall arise between the parties, relative to this contract or specifications, determination or decision of the Owner or the Construction Representative and the Designer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

G. Payments Withheld: The Owner may withhold or nullify in whole or part any certificate to such extent as may be necessary to protect the Owner from loss on account of:

1. Defective work not remedied. When a notice of noncompliance is issued on an item or items, corrective action shall be undertaken immediately. Until corrective action is completed, no monies will be paid and no additional time will be allowed for the item or items. The cost of corrective action(s) shall be borne by the Contractor.

2. A reasonable doubt that this contract can be completed for the unpaid balance.

3. Failure of the Contractor to update as-built drawings monthly for review by the Construction Representative.

4. Failure of the Contractor to update the construction schedule.

When the Construction Representative is satisfied the Contractor has remedied above deficiencies, payment shall be released.

H. Final Payment: Upon receipt of written notice from the Contractor to the Designer and Project Representative that the work is ready for final inspection and acceptance, the Designer and Project Representative, with the Contractor, shall promptly make such inspection. If the work is acceptable and the contract fully performed, the Construction Representative shall complete a final acceptance report and the Contractor will be

directed to submit a final Application and Certification for Payment. If the Owner approves the same, the entire balance shall be due and payable, with the exception of deductions as provided for under Article 5.4.

1. Where the specifications provide for the performance by the Contractor of (certain tests for the purpose of balancing and checking the air conditioning and heating equipment and the Contractor shall have furnished and installed all such equipment in accordance with the specifications, but said test cannot then be made because of climatic conditions, such test shall may be considered as required under the provisions of the specifications, Section 013300 and this contract may be substantial Full payment will not be made until the tests have been made and the equipment and system is finally accepted. If the tests are not completed when scheduled, the Owner may deduct 150% of the value of the tests from the final payment.
2. The final payment shall not become due until the Contractor delivers to the Construction Representative:

    a) A complete file of releases, on the standard form included in the contract documents as "Final Receipt of Payment and Release Form", from subcontractors and material suppliers evidencing payment in full for services, equipment and materials, as the case may require, if the Owner approves, or a consent from the Surety to final payment accepting liability for any unpaid amounts.

    b) An Affidavit of Compliance with Prevailing Wage Law, in the form as included in this contract specifications, properly executed by each subcontractor, and the Contractor

    c) Certified copies of all payrolls

    d) As-built drawings

3. If any claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a claim including all costs and a reasonable attorney's fee.
4. Missouri statute requires prompt payment from the Owner to the Contractor within thirty calendar days and from the Contractor to his subcontractors within fifteen calendar days. Failure to make payments within the required time frame entitles the receiving party to charge interest at the rate of one and one half percent per month calculated from the expiration of the statutory time period until paid.
5. The value of all unused unit price allowances and/or 150% of the value of the outstanding work items, and/or liquidated damages may be deducted from the final pay request without executing a Contract Change. Any unit price items which exceed the number of units in the contract may be added by Contract Change.

ARTICLE 6 -- INSURANCE AND BONDS

ARTICLE 6.1 -- BOND

A. Contractor shall furnish a performance/payment bond in an amount equal to 100% of the contract price to guarantee faithful performance of the contract and 100% of the contract price to guarantee the payment of all persons performing labor on the project and furnishing materials in connection therewith under this contract as set forth in the standard form of performance and payment bond included in the contract documents. The surety on such bond shall be issued by a surety company authorized by the Missouri Department of Insurance to do business in the state of Missouri.

B. All Performance/Payment Bonds furnished in response to this provision shall be provided by a bonding company with a rating of B+ or higher as established by A.M. Best Company, Inc. in their most recent publication.

ARTICLE 6.2 – INSURANCE

A. The successful Contractor shall procure and maintain for the duration of the contract issued a policy or policies of insurance for the protection of both the Contractor and the Owner and their respective officers, officials, agents, consultants and employees. The Owner requires certification of insurance coverage from the Contractor prior to commencing work.

B. Minimum Scope and Extent of Coverage

1. General Liability

Commercial General Liability, ISO coverage form number or equivalent CG 00 01 ("occurrence" basis), or I-SO coverage form number CG 00 02, or ISO equivalent.

If ISO equivalent or manuscript general liability coverage forms are used, minimum coverage will be as follows: Premises/Operations; Independent Contractors; Products/Completed Operations; personal Injury; Broad Form Property Damage including Completed Operations; Broad Form Contractual Liability Coverage to include Contractor's obligations under Article 1.11 Indemnification and any other Special Hazards required by the work of the contract.

2. Automobile Liability

Business Automobile Liability Insurance, ISO Coverage form number or equivalent CA 00 01 covering automobile liability, code 1 "ANY AUTO".

3. Workers' Compensation and Employer's Liability

Statutory Workers' Compensation Insurance for Missouri and standard Employer's Liability Insurance, or the authorization to self-insure for such liability from the Missouri Division of Workers' Compensation.

4. Builder's Risk or Installation Floater Insurance

Insurance upon the work and all materials, equipment, supplies, temporary structures and similar items which may be incident to the performance of the work and located at or adjacent to the site, against loss or damage from fire and such other casualties as are included in extended coverage in broad "All Risk" form, including coverage for Flood and Earthquake, in an amount not less than the replacement cost of the work or this contact price, whichever is greater, with loss payable to Contractor and Owner as their respective interests may appear.

Contractor shall maintain sufficient insurance to cover the full value of the work and materials as the work progresses, and shall furnish Owner copies of all endorsements. If Builder's Risk Reporting- Form of Endorsement is used, Contractor shall make all reports as required therein so as to keep in force an amount of insurance which will equal the replacement cost of the work, materials, equipment, supplies, temporary structures, and other property covered thereby; and if, as a result of Contractor's failure to make any such report, the amount of insurance so recoverable shall be less than such replacement cost, Contractor's interest in the proceeds of such insurance, if any, shall be subordinated to Owner's interest to the end that Owner may receive full reimbursement for its loss.

C. Minimum Limits of Insurance

1. General Liability

Contractor

$2,000,000	combined single limit per occurrence for bodily injury, personal injury, and property damage
$2,000,000	annual aggregate

2. Automobile Liability

$2,000,000	combined single limit per occurrence for bodily injury and property damage

3. Workers' Compensation and Employers Liability

Workers' Compensation limits as required by applicable State Statutes (generally unlimited) and minimum of $1,000,000 limit per accident for Employer's Liability.

General Liability and Automobile Liability insurance may be arranged under individual policies for the full limits required or by a combination of underlying policies with the balance provided by a form-following Excess or Umbrella Liability policy.

D. Deductibles and Self-Insured Retentions

All deductibles, co-payment clauses, and self-insured retentions must be declared to and approved by the Owner. The Owner reserves the right to request the reduction or elimination of unacceptable deductibles or self-insured retentions, as they would apply to the Owner, and their respective officers, officials, agents, consultants and employees. Alternatively, the Owner may request Contractor to procure a bond guaranteeing

payment of losses and related investigations, claims administration, and defense expenses.

E. Other Insurance Provisions and Requirements

The respective insurance policies and coverage, as specified below, must contain, or be endorsed to contain the following conditions or provisions:

1. General Liability

The Owner, and its respective commissioners, officers, officials, agents, consultants and employees shall be endorsed as additional insured's by ISO form CG 20 26 Additional Insured - Designated Person or Organization. As additional insured's, they shall be covered as to work performed by or on behalf of the Contractor or as to liability which arises out of Contractor's activities or resulting from the performance of services or the delivery of goods called for by the Contract.

Contractor's insurance coverage shall be primary with respect to all additional insured's. Insurance of self-insurance programs maintained by the designated additional -insured's shall be excess of the Contractor's insurance and shall not contribute with it.

Additionally, the Contractor and Contractor's general liability insurer shall agree to waive all rights of subrogation against the Owner and any of their respective officers, officials, agents, consultants or employees for claims, losses, or expenses which arise out of Contractor's activities or result from the performance of services or the delivery of goods called for by the Contract.

Contractor's failure to comply with the terms and conditions of these insurance policies shall not affect or abridge coverage for the Owner, or for any of their officers, officials, agents, consultants or employees.

2. Automobile Insurance

The Owner, and their respective officers, officials, agents, consultants and employees shall be endorsed as additional insured's by ISO form CG 20 26 - Additional Insured Designated Person or Organization. As additional insured's, they shall be covered as to work performed by or on behalf of the Contractor or as to liability which arises out of Contractor's activities or resulting from the performance of services or the delivery of goods called for by the Contract.

Contractor's insurance coverage shall be primary with respect to all additional insured's. Insurance or self-insurance programs maintained by the designated additional insured's shall be in excess of the Contractor's insurance and shall not contribute with it.

Additionally, the Contractor and Contractor's automobile insurer shall agree to waive all rights of subrogation against the Owner and any of their respective officers, officials, agents, consultants or employees for claims, losses, or expenses which arise out of Contractor's activities or result from the performance of services or the delivery of goods called for by the Contract.

Contractor's failure to comply with the terms and conditions of these insurance policies shall not affect or abridge coverage for the Owner or for any of its officers, officials, agents, consultants or employees.

3. Workers' Compensation/Employer's Liability

Contractor's workers' compensation insurance shall be endorsed with NCCI form WC 00 03 01 A - Alternative Employer Endorsement. The Alternative Employer Endorsement shall designate the Owner as "alternate employers."

4. All Coverages

Each insurance policy required by this section of the Contract shall contain a stipulation, endorsed if necessary, that the Owner will receive a minimum of a thirty (30) calendar day advance notice of any policy cancellation. Ten (10) calendar days advance notice is required for policy cancellation due to non-payment of premium.

F. Insurer Qualifications and Acceptability

Insurance required hereunder shall be issued by an A.M. Best, "B+" rated, Class IX insurance company approved to conduct insurance business in the state of Missouri.

G. Verification of Insurance Coverage

Prior to Owner issuing a Notice to Proceed, the Contractor-shall furnish the Owner with Certificate(s) of Insurance and with any applicable original endorsements evidencing the required insurance coverage. The insurance certificates and endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates and endorsements received by the Owner are subject to review and approval by the Owner. The Owner reserves the right to require certified copies of all required policies at any time. If the scope of this contract will exceed one (1) year - or, if any of Contractor's applicable insurance coverage expires prior to completion of the work or services required under this contract -

the Contractor will provide a renewal or replacement certificate before continuing work or services hereunder. If the Contractor fails to provide documentation of required insurance coverage, the Owner may issue a stop work order and no additional contract completion time and/or compensation shall be granted as a result thereof.

ARTICLE 7 – SUSPENSION OR TERMINATION OF CONTRACT

ARTICLE 7.1 - FOR SITE CONDITIONS

When conditions at the site of the proposed work are considered by the Owner to be unsatisfactory for prosecution of the work, the Contractor may be ordered in writing to suspend the work or any part thereof until reasonable conditions exist. When such suspension is not due to fault or negligence of the Contractor, time allowed for completion of such suspended work will be extended by a period of time equal to that lost due to delay occasioned by ordered suspension. This will be a no cost time extension.

ARTICLE 7.2 - FOR CAUSE

A. Termination or Suspension for Cause:

1. If the Contractor shall file for bankruptcy, or should make a general assignment for the benefit of the creditors, or if a receiver should be appointed on account of insolvency, or if the contractor should persistently or repeatedly refuse or fail to supply enough properly skilled workers or proper materials, or if the contractor should fail to make prompt payment to subcontractors or for material or labor, or persistently disregard laws, ordinances or the instructions of the Owner, or otherwise be guilty of a substantial violation of any provision of this contract, then the Owner may serve notice on the Contractor and the surety setting forth the violations and demanding compliance with this contract. Unless within ten (10) consecutive calendar days after serving such notice, such violations shall cease and satisfactory arrangements for correction be made, the Owner may suspend the Contractor's right to proceed with the work or terminate this contract.

2. In the event the Owner suspends Contractor's right to proceed with the work or terminates the contract, the Owner may demand that the Contractor's surety take over and complete the work on this contract, after the surety submits a written proposal to the Owner and receives written approval and upon the surety's failure or refusal to do so within ten (10) consecutive calendar days after demand therefore, the Owner may take over the work and prosecute the same to completion by bid or negotiated contract, or the Owner may elect to take possession of and utilize in completing the work such materials, supplies, appliances and plant as may be on the site of the work, and all subcontractors, if the Owner elects, shall be bound to perform their contracts.

B. The Contractor and its surety shall be and remain liable to the Owner for any excess cost or damages occasioned to the Owner as a result of the actions above set forth.

C. The Contractor in the event of such suspension or termination shall not be entitled to receive any further payments under this contract until the work is wholly finished. Then if the unpaid balance under this contract shall exceed all expenses of the Owner as certified by the Director, such excess shall be paid to the Contractor; but, if such expenses shall exceed the unpaid balance as certified by the Director, the Contractor and their surety shall be liable for and shall pay the difference and any damages to the Owner.

D. In exercising Owner's right to secure completion of the work under any of the provisions hereof, the Director shall have the right to exercise Owner's sole discretion as to the manner, methods and reasonableness of costs of completing the work.

E. The rights of the Owner to suspend or terminate as herein provided shall be cumulative and not exclusive and shall be in addition to any other remedy provided by law.

F. The Contractor in the event of such suspension or termination may be declared ineligible for Owner contracts for a minimal period of twelve (12) months. Further, no contract will be awarded to any Contractor who lists in their bid form any subcontractor whose prior performance has contributed, as determined by the Owner, to a breach of a contract. In order to be considered for state-awarded contracts after this period, the Contractor/subcontractor will be required to forward acceptance reports to the Owner regarding successful completion of non-state projects during the intervening twelve (12) months from the date of default. No contracts will be awarded to a subcontractor/Contractor until the ability to perform responsibly in the private sector has been proven to the Owner.

ARTICLE 7.3 -- FOR CONVENIENCE

A. The Owner may terminate or suspend the Contract or any portion of the Work without cause at any time, and at the Owner's convenience. Notification of a termination or suspension shall be in writing

and shall be given to the Contractor and their surety. If the Contract is suspended, the notice will contain the anticipated duration of the suspension or the conditions under which work will be permitted to resume. If appropriate, the Contractor will be requested to demobilize and re-mobilize and will be reimbursed time and costs associated with the suspension.

B. Upon receipt of notification, the Contractor shall:

1. Cease operations when directed.

2. Take actions to protect the work and any stored materials.

3. Place no further subcontracts or orders for material, supplies, services or facilities except as may be necessary to complete the portion of the Contract that has not been terminated. No claim for payment of materials or supplies ordered after the termination date shall be considered.

4. Terminate all existing subcontracts, rentals, material, and equipment orders.

5. Settle all outstanding liabilities arising from termination with subcontractors and suppliers.

6. Transfer title and deliver to the Owner, work in progress, completed work, supplies and other material produced or acquire for the work terminated, and completed or partially completed plans, drawings information and other property that, if the Contract had been completed, would be required to be furnished to the Owner.

C. For termination without cause and at the Owner's convenience, in addition to payment for work completed prior to date of termination, the Contractor may be entitled to payment of other documented costs directly associated with the early termination of the contract. Payment for anticipated profit and unapplied overhead will not be allowed.

SECTION 007300 - SUPPLEMENTARY CONDITIONS

1.0 GENERAL:

A. These Supplementary General Conditions clarify, add, delete, or otherwise modify standard terms and conditions of DIVISION 0, BIDDING AND CONTRACTING REQUIREMENTS.

2.0 CONTACTS:

Designer:
Elaine Palliser Lewis
L2E Solutions
20 S. Sarah Street
St. Louis, Missouri 63108
Telephone: (314) 730-2779
Email: elaine.lewis@l2eco.com

Construction Representative:
Carl Haley
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: (573) 645-7834
Email: carl.haley@oa.mo.gov

Project Manager:
Jared Cook
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: (573) 690-6733
Email: jared.cook2@oa.mo.gov

Contract Specialist:
Paul Girouard
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: (573) 751-4797
Email: paul.girouard@oa.mo.gov

3.0 NOTICE: ALL BID MATERIALS ARE DUE AT THE TIME OF BID SUBMITTAL. THERE IS NO SECOND SUBMITTAL FOR THIS PROJECT.

4.0 FURNISHING CONSTRUCTION DOCUMENTS:

A. The Owner will furnish the Contractor with approximately 5 complete sets of drawings and specifications at no charge.

B. The Owner will furnish the Contractor with approximately 5 sets of explanatory or change drawings at no charge.

C. The Contractor may make copies of the documents as needed with no additional cost to the Owner.

5.0 SAFETY REQUIREMENTS

Contractor and subcontractors at any tier shall comply with RSMo 292.675 and Article 1.3, E, of Section 007213, General Conditions.

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Missouri
Division of Labor Standards
WAGE AND HOUR SECTION

MICHAEL L. PARSON, Governor

Annual Wage Order No. 31

Section 014
CALLAWAY COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by
Todd Smith, Director
Division of Labor Standards

Filed With Secretary of State: **March 8, 2024**

Last Date Objections May Be Filed: **April 8, 2024**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	$64.74
Boilermaker	$77.09
Bricklayer-Stone Mason	$54.01
Carpenter	$52.31
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	$31.08*
Plasterer	
Communication Technician	$57.70
Electrician (Inside Wireman)	$57.92
Electrician Outside Lineman	$31.08*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	$31.08*
Glazier	$28.75
Ironworker	$70.90
Laborer	$42.92
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	$31.08*
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	$65.90
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	$43.65
Plumber	$79.68
Pipe Fitter	
Roofer	$55.07
Sheet Metal Worker	$56.93
Sprinkler Fitter	$31.08*
Truck Driver	$44.57
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. The public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.
**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title as defined in RSMo Section 290.210.

Heavy Construction Rates for
CALLAWAY County

Section 014

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	$61.88
Millwright	
Pile Driver	
Electrician (Outside Lineman)	$31.08*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	$49.26
General Laborer	
Skilled Laborer	
Operating Engineer	$66.97
Group I	
Group II	
Group III	
Group IV	
Truck Driver	$31.08*
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate Sheet.

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. Public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title.

OVERTIME
and
HOLIDAYS

OVERTIME

For all work performed on a Sunday or a holiday, not less than twice (2x) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work.

For all overtime work performed, not less than one and one-half (1½) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work or contractual obligation. For purposes of this subdivision, **"overtime work"** shall include work that exceeds ten hours in one day and work in excess of forty hours in one calendar week; and

A thirty-minute lunch period on each calendar day shall be allowed for each worker on a public works project, provided that such time shall not be considered as time worked.

HOLIDAYS

January first;
The last Monday in May;
July fourth;
The first Monday in September;
November eleventh;
The fourth Thursday in November; and
December twenty-fifth;

If any holiday falls on a Sunday, the following Monday shall be considered a holiday.

SECTION 011000 – SUMMARY OF WORK

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 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project consists of

1. Project Location: **Fulton State Hospital, Fulton Missouri**
600 E. 5th Street, Fulton, MO 65251

2. Owner: State of Missouri, Office of Administration, Division of Facilities Management, Design and Construction, Harry S Truman State Office Building, Post Office Box 809, 301 West High Street, Jefferson City, Missouri 65102.

B. Contract Documents dated August 23, 2024 **-** were prepared for the Project by **L2e Solutions, 20 S. Sarah, St. Louis, MO 63108 and Astral Engineers, PO Box 190 Rancho Cucamonga, CA 91729**.

C. The Work consists of

1. The Work includes removal and replacement of existing casework, display cabinets, grilles, devices, fixtures, ceilings, partitions and other items to meet ligature resistant requirements, see drawings dated September 22, 2024 for specific scope of work**.**

D. The Work will be constructed under a single prime contract.

1.3 WORK UNDER OTHER CONTRACTS

A. Cooperate fully with separate contractors on site so that work under those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

1.4 WORK SEQUENCE

A. The Work will be conducted in phases as required for contractor access to each ward within the facility. Contractor is to coordinate phasing/schedule with the facility for the movement of patients to allow access for construction.

1. In the Guhleman Building patient wards will be vacated by the facility for construction. Contractor will have full access to one ward at a time to complete construction and must coordinate with the facility for the movement of patients to access the next ward.
2. The Hearnes Building will remain occupied during construction activities. Patients will be moved in the morning and will return in the afternoon. Work hours in the Hearnes Building will be from 9:00 am to 3:30 pm to allow the facility time to move patients and the contractor must secure/complete construction at the end of each day.

3. The Nixon Building will remain occupied during construction; contractor will need to coordinate access with the facility and must secure/complete construction at the end of each day.

1.5 CONTRACTOR USE OF PREMISES

A. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. Owner Occupancy: Allow for Owner occupancy and use by the public.

2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Use of the Existing Building: Maintain the existing building in a weathertight condition throughout the construction period. Repair all damage caused by construction operations to match existing. Take all precautions necessary to protect the building and its occupants during the construction period and secure all materials and equipment at all times.

1.6 OCCUPANCY REQUIREMENTS

A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate owner usage. Perform the Work so as not to interfere with the Owner's operations.

1. Some areas on site will be vacated during construction, but the facility will remain occupied. Coordinate all construction activities with the facility staff.

1.7 MISCELLANEOUS PROVISIONS

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 011000

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing Alternates.

1.3 DEFINITIONS

A. Definition: An alternate is an amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents..

1. The cost for each alternate is the net addition to the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent Work as necessary to completely and fully integrate the Alternate Work into the Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.

B. Notification: The award of the Contract will indicate whether alternates have been accepted or rejected.

C. Execute accepted alternates under the same conditions as other Work of this Contract.

D. Schedule: A “Schedule of Alternates” is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials necessary to achieve the Work described under each alternate.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Remove the existing fire hose cabinets and replace with new ligature resistant recessed fire hose cabinets as indicated in the drawings. Patch/paint the existing wall construction to match existing.

1. Additional time: 20 calendar days

B. Alternate No. 2: Remove the existing locker system and reinstall new ligature resistant locker system. Patch/paint the existing wall construction to match existing.

1. Additional time: 10 calendar days

END OF SECTION 012300

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.

B. Related Sections include the following:

1. Division 1, Section 013115 “Project Management Communications” for administrative requirements for communications.

2. Division 0, Section 007213, Article 3.1 "Acceptable Substitutions" for administrative procedures for handling Requests for Substitutions made after Contract award.

3. Division 0, Section 007213, Article 4.0 "Changes in the Work" for Change Order requirements.

1.3 REQUESTS FOR INFORMATION

A. In the event that the Contractor or Subcontractor, at any tier, determines that some portion of the Drawings, Specifications, or other Contract Documents requires clarification or interpretation, the Contractor shall submit a “Request for Information” (RFI) in writing to the Designer. A RFI may only be submitted by the Contractor and shall only be submitted on the RFI forms provided by the Owner. The Contractor shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed. In the RFI, the Contractor shall set forth an interpretation or understanding of the requirement along with reasons why such an understanding was reached.

B. Responses to RFI shall be issued within ten (10) working days of receipt of the Request from the Contractor unless the Designer determines that a longer time is necessary to provide an adequate response. If a longer time is determined necessary by the Designer, the Designer will, within five (5) working days of receipt of the request, notify the Contractor of the anticipated response time. If the Contactor submits a RFI on a time sensitive activity on the current project schedule, the Contractor shall not be entitled to any time extension due to the time it takes the Designer to respond to the request provided that the Designer responds within the ten (10) working days set forth above.

C. Responses from the Designer will not change any requirement of the Contract Documents. In the event the Contractor believes that a response to a RFI will cause a change to the requirements of the Contract Document, the Contractor shall give written notice to the Designer requesting a Change Order for the work. Failure to give such written notice within ten (10) working days, shall waive the Contractor’s right to seek additional time or cost under Article 4, “Changes in the Work” of the General Conditions.

1.4 MINOR CHANGES IN THE WORK

A. Designer will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Amount or the Contract Time, on ”Designer’s Supplemental Instructions” (DSI).

1.5 PROPOSAL REQUESTS

A. The Designer or Owner Representative will issue a detailed description of proposed Changes in the Work that may require adjustment to the Contract Amount or the Contract Time. The proposed Change Description will be issued using the “Request for Proposal” (RFP) form. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by the Designer or Owner Representative are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.

2. Within ten (10) working days after receipt of Proposal Request, submit a proposal for the cost adjustments to the Contract Amount and the Contract Time necessary to execute the Change. The Contractor shall submit his proposal on the appropriate Change Order Detailed Breakdown form. Subcontractors may use the appropriate Change Order Detailed Breakdown form or submit their proposal on their letterhead provided the same level of detail is included. All proposals shall include:

   a. A detailed breakdown of costs per Article 4.1 of the General Conditions.

   b. If requesting additional time per Article 4.2 of the General Conditions, 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.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, the Designer or Owner Representative will issue a Change Order for signatures of Owner and Contractor on the “Change Order” form.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 013100 – COORDINATION

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 provisions for coordinating construction operations on Projects including, but not limited to, the following:

1. Coordination Drawings.
2. Administrative and supervisory personnel.
3. Project meetings.

B. Each Contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific Contractor.

C. Related Sections include the following:

1. Division 1, Section 013200 "Schedules" for preparing and submitting Contractor's Construction Schedule.
2. Articles 1.8.B and 1.8.C of Section 007213 "General Conditions" for coordinating meetings onsite.
3. Article 5.4.H of Section 007213 "General Conditions" for coordinating Closeout of the Contract.

1.3 COORDINATION

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, which depend on each other for proper installation, connection, and operation.

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 accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required

maintenance, service, and repair of all components including mechanical and electrical.

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. Startup and adjustment of systems.
8. Project Closeout activities.

1.4 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

B. Key Personnel Names: Within fifteen (15) work 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 and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Keep list current and accessible at all times.

1.5 PROJECT MEETINGS

A. The Owner’s Construction Representative will schedule a Pre-Construction Meeting prior to beginning of construction. The date, time, and exact place of this meeting will be determined after Contract Award and notification of all interested parties. The Contractor shall arrange to have the Job Superintendent and all prime Subcontractors present at the meeting. During the Pre-Construction Meeting, the construction procedures and information necessary for submitting payment requests will be discussed and materials distributed along with any other pertinent information.

1. Minutes: Designer will record and distribute meeting minutes.

B. Progress Meetings: The Owner's Construction Representative will conduct Monthly Progress Meetings as stated in Articles 1.8.B and 1.8.C of Section 007213 "General Conditions".

1. Minutes: Designer will record and distribute to Contractor the meeting minutes.

C. Preinstallation Conferences: Contractor shall 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 Designer and Construction Representative 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 problems

k. Time schedules

l. Weather limitations

m. Manufacturer's written recommendations

n. Warranty requirements

o. Compatibility of materials

p. Acceptability of substrates

q. Temporary facilities and controls

r. Space and access limitations

s. Regulations of authorities having jurisdiction

t. Testing and inspecting requirements

u. Installation procedures

v. Coordination with other Work

w. Required performance results

x. Protection of adjacent Work

y. Protection of construction and personnel

3. Contractor shall 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 parties who should have been present.

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.

6. Revise paragraph below if Project requires holding progress meetings at different intervals. Insert special intervals such as "every third Tuesday" to suit special circumstances.

7. Project name

8. Name and address of Contractor

9. Name and address of Designer

10. RFI number including RFIs that were dropped and not submitted

11. RFI description

12. Date the RFI was submitted

13. Date Designer's response was received

14. Identification of related DSI or Proposal Request, as appropriate

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 – SCHEDULES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes requirements for a Bar Chart Schedule for the project construction activities, schedule of submittals, and schedule for testing.

PART 2 - PRODUCTS – (Not Applicable)

PART 3 - EXECUTION

3.1 SUBMITTAL PROCEDURES

A. The Contractor shall submit to the Designer, within ten (10) working days following the Notice to Proceed, a Progress Schedule including Schedule of Values showing the rate of progress the Contractor agrees to maintain and the order in which he proposed to carry out the various phases of Work. No payments shall be made to the Contractor until the Progress Schedule has been approved by the Owner.

1. The Schedule of Values must have the following line items included with the value of the item as indicated below:

   a. O&M's (Owner's Manual)

      1) $1,000,000.00 (one million) and under – 2% of the total contract

      2) Over $1,000,000.00 (one million) – 1% of the total contract

   b. Close Out Documents

      1) $1,000,000.00 (one million) and under – 2% of the total contract

      2) Over $1,000,000.00 (one million) – 1% of the total contract

   c. General Conditions

      1) No more than 10%

B. The Contractor shall submit an updated Schedule for presentation at each Monthly Progress Meeting. The Schedule shall be updated by the Contractor as necessary to reflect the current Schedule and its relationship to the original Schedule. The updated Schedule shall reflect any changes in the logic, sequence, durations, or completion date. Payments to the Contractor shall be suspended if the Progress Schedule is not adequately updated to reflect actual conditions.

C. The Contractor shall submit Progress Schedules to Subcontractors to permit coordinating their Progress Schedules to the general construction Work. The Contractor shall coordinate preparation and processing of Schedules and reports with performance of other construction activities.

3.2 CONSTRUCTION PROGRESS SCHEDULE – BAR CHART SCHEDULE

A. Bar-Chart Schedule: The Contractor shall prepare a comprehensive, fully developed, horizontal bar chart-type Contractor's Construction Schedule. The Contractor for general construction shall prepare the Construction Schedule for the entire Project. The Schedule shall show the percentage of work to be completed at any time, anticipated monthly payments by Owner, as well as significant dates (such as completion of excavation, concrete foundation work, underground lines, superstructure, rough-ins, enclosure, hanging of fixtures, etc.) which shall serve as check points to determine compliance with the approved Schedule. The Schedule shall also include an activity for the number of "bad" weather days specified in Section 012100 – Allowances.

1. The Contractor shall provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week.

    a. If practical, use the same Schedule of Values breakdown for schedule time bars.

2. The Contractor shall provide a base activity time bar showing duration for each construction activity. Each bar is to indicate start and completion dates for the activity. The Contractor is to place a contrasting bar below each original schedule activity time for indicating actual progress and planned remaining duration for the activity.

3. The Contractor shall prepare the Schedule on a minimal number of separate sheets to readily show the data for the entire construction period.

4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on schedule with other construction activities. Include minor elements involved in the overall sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.

5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other required schedules and reports.

6. Indicate the Intent to Award and the Contract Substantial Completion dates on the schedule.

B. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by the following:

1. Requirement for Phased completion
2. Work by separate Contractors
3. Work by the Owner
4. Pre-purchased materials
5. Coordination with existing construction
6. Limitations of continued occupancies
7. Un-interruptible services
8. Partial Occupancy prior to Substantial Completion
9. Site restrictions

10. Provisions for future construction
11. Seasonal variations
12. Environmental control

C. Work Stages: Use crosshatched bars to indicate important stages of construction for each major portion of the Work. Such stages include, but are not necessarily limited to, the following:

1. Subcontract awards
2. Submittals
3. Purchases
4. Mockups
5. Fabrication
6. Sample testing
7. Deliveries
8. Installation
9. Testing
10. Adjusting
11. Startup and placement into final use and operation

D. Area Separations: Provide a separate time bar to identify each major area of construction for each major portion of the Work. For the purposes of this Article, a "major area" is a story of construction, a separate building, or a similar significant construction element.

1. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
    a. Completion of mechanical installation
    b. Completion of the electrical portion of the Work
    c. Substantial Completion

3.3 SCHEDULE OF SUBMITTALS

A. Upon acceptance of the Construction Progress Schedule, prepare and submit a complete schedule of submittals. Coordinate the submittal schedule with Section 013300 SUBMITTALS, the approved Construction Progress Schedule, list of subcontracts, Schedule of Values and the list of products.

B. Prepare the schedule in chronological order. Provide the following information

1. Scheduled date for the first submittal
2. Related Section number
3. Submittal category
4. Name of the Subcontractor
5. Description of the part of the Work covered

6. Scheduled date for resubmittal

7. Scheduled date for the Designer's final release or approval

C. Distribution: Following the Designer's response to the initial submittal schedule, print and distribute copies to the Designer, Owner, subcontractors, and other parties required to comply with submittal dates indicated.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned part of the Work and are no longer involved in construction activities.

D. Schedule Updating: Revise the schedule after each meeting or other activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

3.4 SCHEDULE OF INSPECTIONS AND TESTS

A. Prepare a schedule of inspections, tests, and similar services required by the Contract Documents. Submit the schedule with (15) days of the date established for commencement of the Contract Work. The Contractor is to notify the testing agency at least (5) working days in advance of the required tests unless otherwise specified.

B. Form: This schedule shall be in tabular form and shall include, but not be limited to:

1. Specification Section number

2. Description of the test

3. Identification of applicable standards

4. Identification of test methods

5. Number of tests required

6. Time schedule or time span for tests

7. Entity responsible for performing tests

8. Requirements for taking samples

9. Unique characteristics of each service

C. Distribution: Distribute the schedule to the Owner, Architect, and each party involved in performance of portions of the Work where inspections and tests are required.

END OF SECTION 013200

SECTION 013300 – SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work including the following:

1. Shop Drawings
2. Product Data
3. Samples
4. Quality Assurance Submittals
5. Construction Photographs
6. Operating and Maintenance Manuals
7. Warranties

B. Administrative Submittals: Refer to General and Supplementary Conditions other applicable Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Construction Progress Schedule including Schedule of Values
2. Performance and Payment Bonds
3. Insurance Certificates
4. Applications for Payment
5. Certified Payroll Reports
6. Partial and Final Receipt of Payment and Release Forms
7. Affidavit – Compliance with Prevailing Wage Law
8. Record Drawings
9. Notifications, Permits, etc.

C. The Contractor is obliged and responsible to check all shop drawings and schedules to assure compliance with contract plans and specifications. The Contractor is responsible for the content of the shop drawings and coordination with other contract work. Shop drawings and schedules shall indicate, in detail, all parts of an Item or Work including erection and setting instructions and integration with the Work of other trades.

D. The Contractor shall at all times make a copy, of all approved submittals, available on site to the Construction Representative.

1.3 SUBMITTAL PROCEDURES

A. The Contractor shall comply with the General and Supplementary Conditions and other applicable sections of the Contract Documents. The Contractor shall submit, with such promptness as to cause no delay in his work or in that of any other contractors, all required submittals indicated in Part 3.1 of this section and elsewhere in the Contract Documents. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

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 elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

    a. The Designer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

B. Each drawing and/or series of drawings submitted must be accompanied by a letter of transmittal giving a list of the titles and numbers of the drawings. Each series shall be numbered consecutively for ready reference and each drawing shall be marked with the following information:

1. Date of Submission

2. Name of Project

3. Location

4. Section Number of Specification

5. State Project Number

6. Name of Submitting Contractor

7. Name of Subcontractor

8. Indicate if Item is submitted as specified or as a substitution.

1.4 SHOP DRAWINGS

A. Comply with the General Conditions, Article 3.2.

B. The Contractor shall submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

C. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings including the following information:

1. Dimensions

2. Identification of products and materials included by sheet and detail number.

3. Compliance with specified standards

4. Notation of coordination requirements

5. Notation of dimensions established by field measurement.

6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8½"x11" but no larger than 36"x48".

1.5 PRODUCT DATA

A. The Contractor shall comply with the General Conditions, Article 3.2.

B. The Contractor shall collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information including the following information:

   a. Manufacturer's printed recommendations

   b. Compliance with Trade Association standards

   c. Compliance with recognized Testing Agency standards

   d. Application of Testing Agency labels and seals

   e. Notation of dimensions verified by field measurement.

   f. Notation of coordination requirements

2. Do not submit Product Data until compliance with the requirements of the Contract Documents has been confirmed.

1.6 SAMPLES

A. The Contractor shall comply with the General Conditions, Article 3.2.

B. The Contractor shall submit full-size, fully fabricated samples, cured and finished as specified, and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.

1. The Contractor shall mount or display samples in the manner to facilitate review of qualities indicated. Prepare samples to match the Designer's sample including the following:

   a. Specification Section number and reference

   b. Generic description of the Sample

   c. Sample source.

   d. Product name or name of the Manufacturer

   e. Compliance with recognized standards

   f. Availability and delivery time

2. The Contractor shall submit samples for review of size, kind, color, pattern, and texture. Submit samples for a final check of these characteristics with other

elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show approximate limits of the variations.

b. Refer to other Specification Sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

c. Refer to other Sections for samples to be returned to the Contractor for incorporation in the Work. Such samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of sample submittals.

d. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.

3. Field samples are full-size examples erected onsite to illustrate finishes, coatings, or finish materials and to establish the Project standard.

a. The Contractor shall comply with submittal requirements to the fullest extent possible. The Contractor shall process transmittal forms to provide a record of activity.

1.7 QUALITY ASSURANCE DOCUMENTS

A. The Contractor shall comply with the General Conditions, Article 3.2

B. The Contractor shall submit quality control submittals including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

C. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the Manufacturer certifying compliance with specified requirements.

1. Signature: Certification shall be signed by an officer of the Manufacturer or other individual authorized to contractually bind the Company.

D. Inspection and Test Reports: The Contractor shall submit the required inspection and test reports from independent testing agencies as specified in this Section and in other Sections of the Contract Documents.

1.8 OPERATING AND MAINTENANCE MANUALS AND WARRANTIES

A. The Contractor shall submit all required manufacturer's operating instructions, maintenance/service manuals, and warranties in accordance with the General Conditions, Article 3.5, and Supplementary Conditions along with this and other Sections of the Contract Documents.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REQUIRED SUBMITTALS

A. Contractor shall submit the following information for materials and equipment to be provided under this contract.

SPEC SECTION	TITLE	CATEGORY
013100	Coordination	Shop Drawings
013100	Coordination	List of Subcontractors
013200	Schedules	Construction Schedule
013200	Schedules	Schedule of Values
013200	Schedules	List of Subcontractors
013200	Schedules	Major Material Suppliers
013513.16	Site Security and Health Requirements	Test Report
013513.16	Site Security and Health Requirements	Construction Schedule
013513.16	Site Security and Health Requirements	List of Subcontractors
017300	Execution	Shop Drawings
024119	Selective Demolition	Shop Drawings
064113	Wood-Veneer-Faced Architectural Cabinets	Product Data
064113	Wood-Veneer-Faced Architectural Cabinets	Shop Drawings
064113	Wood-Veneer-Faced Architectural Cabinets	Sample
079200	Joint Sealants	Product Data
079200	Joint Sealants	Sample
081213	Hollow Metal Frames	Product Data
081213	Hollow Metal Frames	Shop Drawings
081416	Flush Wood Doors	Product Data
081416	Flush Wood Doors	Shop Drawings
081416	Flush Wood Doors	Sample
081416	Flush Wood Doors	Warranty
087100	Door Hardware	Product Data
087100	Door Hardware	Sample
087100	Door Hardware	Shop Drawings
087100	Door Hardware	Test Report
087100	Door Hardware	Warranty
092216	Non-Structural Metal Framing	Product Data
092900	Gypsum Board	Product Data
099123	Interior Painting	Product Data
099123	Interior Painting	Sample
220719	Plumbing Insulation	Product Data

221005	Plumbing Piping	Product Data
221005	Plumbing Piping	Certification
223000	Plumbing Equipment	Shop Drawings
223000	Plumbing Equipment	Operation / Maintenance Manual
224000	Plumbing Fixtures	Product Data
224000	Plumbing Fixtures	Shop Drawings
230593	Testing, Adjusting and Balancing for HVAC	Test Report
233423	HVAC Power Ventilators	Product Data
233423	HVAC Power Ventilators	Operation / Maintenance Manual
233423	HVAC Power Ventilators	Warranty
233700	Air Outlets and Inlets	Product Data
260519	Voltage Electrical Power Conductors and Cables	Product Data
260519	Voltage Electrical Power Conductors and Cables	Certification
260533.13	Conduit for Electrical Systems	Product Data
262726	Wiring Devices	Product Data
262726	Wiring Devices	Operation / Maintenance Manual
265100	Interior Lighting	Shop Drawings
265100	Interior Lighting	Product Data
265100	Interior Lighting	Operation / Maintenance Manual

SECTION 013513.19 - SITE SECURITY AND HEALTH REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes general Institution rules.

B. This Section includes requirements for infection control in environments that Clients are housed in, dine in, or participate in program activities in or adjacent to the Scope of Work area:

1. The Contractor shall have the applicable measures specified below in-place any time demolition or construction activities occur in occupied or non-occupied project work areas.
2. The Contractor shall complete all specified cleaning procedures and receive clearance from the Construction Representative prior to removing any barriers and other precautionary measures – even for areas that the Clients do not occupy during construction.

1.3 SUBMITTALS

A. List of required submittals:

1. Materials Safety Data Sheets for all hazardous materials to be brought onsite.
2. Schedule of proposed shutdowns, if applicable.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 GENERAL RULES OF THE INSTITUTION

A. All workers and supervisors employed by the Contractor or any Subcontractors shall be made aware that the buildings and grounds are part of a Department of Mental Health facility and that:

1. The Residents or Patients are to be treated with dignity.
2. Construction activities shall not interfere with normal facility operation, except as otherwise arranged with and approved by the Facility Authorities.
3. Access to the Facility, Residents, and Staff by Emergency Responders shall not be compromised at any time.
4. Fire exits, alarm systems, and sprinkler systems shall remain fully operational at all times

unless written approval is received from the Construction Representative and the appropriate Facility Representative at least (24) hours in advance. The Contractor shall submit a written time schedule for any proposed shutdowns.

5. Smoking is not permitted in State-operated buildings. Smoking on grounds shall be in accordance with local Facility regulations and only as approved by Facility Management.
6. Intoxicating beverages or narcotics shall not be brought upon the premises nor shall Contractor's personnel be under the influence of these substances while on the premises.
7. Explosives or firearms and other weapons shall not be allowed onsite.
8. Keys shall not be left in unattended vehicles. Vehicles shall be locked when not in use.
9. The Residents shall not be photographed. Maintaining confidentiality of the Residents shall be required.

B. Because of the persistent risk that Residents or Patients may cause harm to themselves or others, extreme caution and special care must be taken in the interest of safety.

1. Materials, tools, and construction apparatus including ropes, ladders, and flammable liquids shall not be left unattended during working hours and shall be securely stored during non-working hours. Secure storage includes lockable cabinets, rooms, trailers, and rigid fenced areas. The location and use of exterior storage areas shall be approved by the Construction Representative and Facility Management prior to their use.
2. An inventory of tools, equipment, and materials intended to be left unsecured must be submitted to and approved by the Construction Representative in advance.
3. Any missing tools, equipment, or material must be immediately reported to the Construction Representative and Facility Management. Unattended or unsecured tools, equipment, or material that poses a potential risk may be confiscated by Facility Staff and returned after completion of the appropriate request documents by the Contractor.
4. Access to construction areas must be controlled at all times. Appropriate barriers must be erected to secure trenches, pits, wiring, etc.
5. Material Safety Data Sheets, or their equivalent, shall be provided to the Construction Representative for all hazardous materials to be brought onsite at least a day before their delivery.
6. Construction debris and trash must be securely stored in approved containers or removed from the site at least daily.

C. If the safety of Residents or Staff is jeopardized because Safety Guidelines are not properly observed, the Facility Representative will notify the Construction Representative, who may stop the Work until the situation is resolved. In such case, the Work will resume only after the unsafe conditions have been corrected and the Contractor is notified by the Construction Representative to resume the Work.

3.2 ACCESS TO THE SITE

A. The Contractor shall coordinate with the Facility and Construction Representative to establish a schedule for working hours. Normal working hours for this Facility are 7:30AM to 4:00PM Monday through Friday. Working hour changes or overtime are to be requested and approved (48) hours in advance. The need for emergency overtime shall be reported to the Construction Representative as soon as it is evident that overtime is needed.

B. The Contractor shall provide the name and phone number of the individual who is in charge onsite and who can be contacted in case of an emergency. This individual must maintain a

current list of names and addresses of all project construction personnel and to furnish this list to the Construction Representative or Facility Representative upon request.

C. All construction personnel shall be identified to the Facility Representative and, when the Facility Representative feels it is necessary, they will be issued identification cards.

3.3 HEALTH AND TRAFFIC CONTROLS

A. Take all reasonable and necessary measures to reduce air and water pollution by any material or equipment used during construction. Keep volatile wastes in approved covered containers. Do not dispose of volatile wastes or oils in storm or sanitary drains.

B. Keep project area in a neat, clean, orderly, and safe condition at all times. Immediately remove all waste materials. Do not allow trash or rubbish to accumulate. Provide approved onsite containers for collection of trash and rubbish and dispose of it at frequent intervals during progression of the Work.

C. No burning will be permitted on the grounds.

D. Conduct all construction-related activities and management of debris to ensure minimum interference with roadways, streets, walks, utilities, and adjacent facilities.

E. Do not obstruct streets, driveways, walks, or use facilities without permission from the Facility Representative.

F. No driver shall exceed the Facility speed limit of 5mph.

3.4 SPECIFICATION OF REQUIRED INFECTION CONTROL PRECAUTIONS BY CLASS

A. The Facility Contact or the DMH Capital Improvements Administrator will help you determine which Class applies to this particular project.

B. Class I is for inspection and non-invasive type activities. These include, but are not limited to, the removal of ceiling tiles for visual inspection (1) tile per 50SqFt, painting without sanding, wall covering, electrical trim work, minor plumbing, and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.

1. Class I Contractor shall perform the following precautionary measures during the project:

    a. Execute work by methods to minimize raising dust from construction operations.
    b. Immediately replace a ceiling tile displaced for visual inspection.

2. Class I Contractor shall perform the following measures upon completion of the project.

    a. No work is required.

C. Class II is for work that generates minimal to a high level of dust, requires demolition, or removal of any fixed building components or assemblies. Work of this type includes, but is not limited to, installation of telephone and computer cabling, access to chase spaces, cutting of

walls or ceiling where dust migration can be controlled, sanding of walls for painting or wall covering, removal of floor coverings, ceiling tiles and casework, new wall construction, minor duct work, electrical or plumbing work above ceilings, and any activity that cannot be completed within a single work shift.

1. Class II Contractor shall perform the following precautionary measures during the project:

    a. Provide active means to prevent airborne dust from dispersing into the atmosphere.
    b. Water mist work surfaces to control dust while cutting.
    c. Seal unused doors with duct tape.
    d. Block off and seal air vents.
    e. Place dust mat at entrance and exit of work area.
    f. Remove or isolate HVAC system in areas where work is being performed.

2. Class II Contractor shall perform the following measures upon completion of the project:

    a. Wipe work surfaces with disinfectant.
    b. Contain construction waste before transport in tightly covered containers.
    c. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area.
    d. Remove isolation of HVAC system in areas where work was performed.

D. Class III is for major demolition and construction projects. Work includes, but is not limited to, activities which require consecutive work shifts, heavy demolition, the removal of a complete cabling system, and new construction.

1. Class III Contractor shall perform the following precautionary measures during the project:

    a. Remove or isolate HVAC system in area where work is being done to prevent contamination of duct system including block off and seal air vents.
    b. Complete all critical barriers, i.e., drywall, plywood, and plastic to seal area from non-work area or implement control cube method (use cart with plastic covering and sealed connection to worksite with HEPA vacuum for vacuuming prior to exit) before construction begins.
    c. Maintain negative air pressure within worksite utilizing HEPA equipped air filtration units.
    d. Place dust mat at entrance and exit of work area.
    e. Contain construction waste before transport in tightly covered containers.
    f. Cover transport receptacles or carts. Tape covering unless solid lid.

2. Class III Contractor shall perform the following measures upon completion of the project:

    a. Do not remove barriers from work area until completed project is inspected by the Construction Representative and a Representative of the Facility’s Safety and Inspection Control Section.
    b. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction.
    c. Vacuum work area with HEPA filtered vacuums.
    d. Wet mop area with disinfectant.
    e. Remove isolation of HVAC system in areas where work is being performed.

3.5 SECURITY CLEARANCES AND RESTRICTIONS

A. FMDC CONTRACTOR BACKGROUND AND ID BADGE PROCESS

1. All employees of an OA/FDMC contractor (or subcontractor performing work under an OA/FMDC contract) are required to submit a fingerprint check through the Missouri State Highway Patrol (MSHP) and the FBI enabling OA/FMDC to obtain state and national criminal background checks on the employees, unless stated otherwise in the Contractor's contract.
2. FMDC reserves the right to prohibit any employee of the Contractor from performing work in or on the premises of any facility owned, operated, or utilized by the State of Missouri for any reason.
3. The Contractor shall ensure all of its employees submit fingerprints to the Missouri State Highway Patrol and pay for the cost of such background checks. The Contractor shall submit to FMDC via email to FMDCSecurity@oa.mo.gov a list of the names of the Contractor's employees who will be fingerprinted and a signed OA/FMDC Authorization for Release of Information Confidentiality Oath for each employee. All employees of the Contractor approved by FMDC to work at a State facility must obtain a contractor ID badge from FMDC prior to beginning work on-site, unless the Director of FMDC, at the Director's discretion, waives the requirement for a contractor ID badge. The Contractor and its employees must comply with the process for background checks and contractor ID badges found on FMDC's website at: https://oa.mo.gov/facilities/facilities-operations/security-information/fmdc-contractor-background-and-id-badge
4. Fingerprints and Authorization for Release of Information Confidentiality Oath form are valid for one (1) year and must be renewed annually. Changing or adding locations may result in additional required documentation. Certain employees may be required to be fingerprinted more frequently. OA/FMDC reserves the right to request additional background checks at any time for any reason.

B. The Contractor shall notify FMDC via email to FMDCSecurity@oa.mo.gov within 48 hours of anyone severing employment with their company.

3.6 PROTECTION OF PERSONS AND PROPERTY

A. SAFETY PRECAUTIONS AND PROGRAMS

1. The Contractor shall at all times conduct operations under this Contract in a manner to avoid the risk of bodily harm to persons or risk of damage to any property. The Contractor shall promptly take precautions which are necessary and adequate against conditions created during the progress of the Contractor's activities hereunder which involve a risk of bodily harm to persons or a risk of damage to property. The Contractor shall continuously inspect Work, materials, and equipment to discover and determine any such conditions and shall be solely responsible for discovery, determination, and correction of any such conditions. The Contractor shall comply with applicable safety laws, standards, codes, and regulations in the jurisdiction where the Work is being performed, specifically, but without limiting the generality of the foregoing, with rules regulations, and standards adopted pursuant to the Williams-Steiger Occupational Safety and Health Act of 1970 and applicable amendments.
2. All contractors, subcontractors and workers on this project are subject to the Construction Safety Training provisions 292.675 RSMo.

3. In the event the Contractor encounters on the site, material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), lead, mercury, or other material known to be hazardous, which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner's Representative and the Architect in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the Owner's Representative and Contractor if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos or polychlorinated biphenyl (PCB), or when it has been rendered harmless by written agreement of the Owner's Representative and the Contractor. “Rendered Harmless” shall mean that levels of such materials are less than any applicable exposure standards, including but limited to OSHA regulations.

B. SAFETY OF PERSONS AND PROPERTY

1. The Contractor shall take reasonable precautions for safety of, and shall provide protection to prevent damage, injury, or loss to:

    a. clients, staff, the public, construction personnel, and other persons who may be affected thereby;
    b. 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 or the Contractor's Subcontractors of any tier; and
    c. 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.

2. The Contractor shall give notices and comply with applicable laws, standards, codes, ordinances, rules, regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury, or loss.
3. The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, safeguards for safety and protection, including, but not limited to, posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent sites and utilities.
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 the highest degree of care and carry on such activities under supervision of properly qualified personnel.
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 this Section caused in whole or in part by the Contractor, a Subcontractor of any tier, 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 this Section, except damage or loss attributable solely to acts or omissions of Owner or the 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 other obligations stated elsewhere in the Contract.
6. The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents, and the maintaining, enforcing

and supervising of safety precautions and programs. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner's Representative and Architect. The Contractor shall hold regularly scheduled safety meetings to instruct Contractor personnel on safety practices, accident avoidance and prevention, and the Project Safety Program. The Contractor shall furnish safety equipment and enforce the use of such equipment by its employees and its subcontractors of any tier.

7. The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.
8. The Contractor shall promptly report in writing to the Owner all accidents arising out of or in connection with the Work which cause death, lost time injury, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately.
9. The Contractor shall promptly notify in writing to the Owner of any claims for injury or damage to personal property related to the work, either by or against the Contractor.
10. The Owner assumes no responsibility or liability for the physical condition or safety of the Work site or any improvements located on the Work site. The Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustment in either the Contract Sum or Contract Time concerning any failure by the Contractor or any Subcontractor to comply with the requirements of this Paragraph.
11. In no event shall the Owner have control over, charge of, or any responsibility for construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work, notwithstanding any of the rights and authority granted the Owner in the Contract Documents.
12. The Contractor shall maintain at his own cost and expense, adequate, safe and sufficient walkways, platforms, scaffolds, ladders, hoists and all necessary, proper, and adequate equipment, apparatus, and appliances useful in carrying on the Work and which are necessary to make the place of Work safe and free from avoidable danger for clients, staff, the public and construction personnel, and as may be required by safety provisions of applicable laws, ordinances, rules regulations and building and construction codes.

END OF SECTION 013513.19

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SECTION 015000 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes requirements for construction facilities and temporary controls including temporary utilities, support facilities, security, and protection.

B. Temporary utilities include, but are not limited to, the following:

1. Water service and distribution
2. Temporary electric power and light
3. Temporary heat
4. Ventilation
5. Sanitary facilities, including drinking water

C. Support facilities include, but are not limited to, the following:

1. Storage sheds
2. Temporary enclosures
3. Hoists and temporary elevator use
4. Temporary project identification signs and bulletin boards
5. Waste disposal services
6. Rodent and pest control
7. Construction aids and miscellaneous services and facilities

D. Security and protection facilities include, but are not limited to, to following:

1. Barricades, warning signs, and lights
2. Sidewalk bridge or enclosure fence for the site
3. Environmental protection

1.3 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations including, but not limited to, the following:

1. Building code requirements
2. Health and safety regulations
3. Utility company regulations
4. Police, fire department, and rescue squad rules

5. Environmental protection regulations

B. Standards: Comply with NFPA 241 “Standard for Safeguarding Construction, Alterations, and Demolition Operations”. ANSI A10 Series standards for “Safety Requirements for Construction and Demolition”, and NECA Electrical Design Library “Temporary Electrical Facilities”.

1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 “National Electric Code”.

1.4 PROJECT CONDITIONS

A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist onsite.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. If acceptable to the Designer, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.

2.2 EQUIPMENT

A. General: Provide new equipment. If acceptable to the Designer, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.

B. Water Hoses: Provide ¾” heavy-duty, abrasion-resistant, flexible rubber hoses 100’ long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110 to 120V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage rating.

E. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers, or a combination of extinguishers of NFPA-recommended classes for the exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

3.2 TEMPORARY UTILITY INSTALLATION

A. Temporary Water Service: The Owner will provide water for construction purposes from the existing building system. All required temporary extensions shall be provided and removed by the Contractor. Connection points and methods of connection shall be designated and approved by the Construction Representative.

B. Temporary Electric Power Service: The Owner will provide electric power for construction lighting and power tools. Contractors using such services shall pay all costs of temporary services, circuits, outlet, extensions, etc.

C. Temporary Heating and Cooling: The normal heating and/or cooling system of the building shall be maintained in operation during the construction. Should the Contractor find it necessary to interrupt the normal HVAC service to spaces, which have not been vacated for construction, such interruptions shall be pre-scheduled with the Construction Representative.

D. Temporary Toilets: The Owner will provide toilets and associated facilities within the building. All construction personnel will be allowed access only to those specific facilities designated by the Construction Representative.

E. Wash Facilities: The Owner will provide wash facilities within the building. All construction personnel will be allowed access only to those specific facilities designated by the Construction Representative.

F. Drinking-Water Facilities: The Owner will provide drinking water facilities within the building. All construction personnel will be allowed access only to those specific facilities designated by the Construction Representative.

G. All designated utilities will be discussed further at the Pre-Construction meeting and must be approved with the Construction Representative.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Locate temporary construction and support facilities per the Facility as indicated in the Pre-Construction Meeting.

B. Storage Facilities: Areas for storage of building materials on site will be discussed at the Pre-Bid Meeting and Pre-Construction Meeting and must be secured at the contractor’s expense.

C. Construction Parking: Contractors must be prepared to discuss their storage and parking needs at the Pre-Bid Meeting. Parking at the site will be provided in the areas designated at the Pre-Construction Meeting. Under no circumstances will any vehicle be parked in a fire lane. Parking on lawns shall be prohibited.

D. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate, provide lighting including flashing red or amber lights.

B. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that project harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from person or firms near the site and discuss use with COR prior to construction.

C. Fencing: At all dumpster and staging areas on site, comply with Facility standard security requirements. Provide a 10’-0” fence anchored with concrete block barricades per security requirements.

3.5 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

C. Termination and Removal: Unless the Designer requests that it be maintained longer, remove each temporary facility when the need has ended or no later than Substantial Completion. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the Contractor’s property. The Owner reserves the right to take possession of project identification signs.

2. At Substantial Completion, clean and renovate permanent facilities used during the construction period, restore to existing condition.

END OF SECTION 015000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Installation of the Work.
3. Cutting and patching.
4. Progress cleaning.
5. Starting and adjusting.
6. Protection of installed construction.
7. Correction of the Work.

B. Related Requirements:

1. Section 011000 "Summary of Work" for limits on use of Project site.
2. Section 007213 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
3. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and

patch structural elements in a manner that could change their load-carrying capacity or increase deflection

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

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.

B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

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 the Architect and COR for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. 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.

B. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work.
2. List of detrimental conditions, including substrates.

3. List of unacceptable installation tolerances.
4. Recommended corrections.

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. 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.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect.

3.3 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of **96 inches** in occupied spaces and **90 inches** in unoccupied spaces.

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. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels. Verify noisy equipment use with COR for approval prior to use.

F. 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.

G. 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.

H. 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.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 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.

E. 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.

F. 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. 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.
4. Proceed with patching after construction operations requiring cutting are complete.

G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

    a. Use containers intended for holding waste materials of type to be stored.

3. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

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. 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.

H. 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.

I. 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.

3.6 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.

3.7 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 017400 – CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for cleaning during the Project.

B. Environmental Requirements: Conduct cleaning and waste-disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and anti-pollution regulations.

1. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

2. Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator for the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

A. General

1. Retain all stored items in an orderly arrangement allowing maximum access, not impending drainage or traffic, and providing the required protection of materials.

2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for construction of this Work.

3. Daily, completely remove all scrap, debris, and waste material from the jobsite.

4. Provide adequate storage for all items awaiting removal from the jobsite, observing all requirements for fire protection and protection of the ecology.

B. Site

1. Daily, inspect the site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.

2. Weekly, inspect all arrangements of materials stored onsite. Re-stack, tidy, or otherwise service all material arrangements.

3. Maintain the site in a neat and orderly condition at all times.

3.2 FINAL CLEANING

A. General: Provide final cleaning operations when indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or a portion of the Project.

1. Remove tools, construction equipment, machinery, and surplus material from the site.

2. Clean exposed hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition.

3. Remove labels that are not permanent labels.

4. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

a. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

5. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

6. Clean plumbing fixtures to a sanitary condition free of stains, including stains resulting from water exposure.

7. Leave the Project clean and ready for occupancy.

C. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.

D. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of lawfully.

1. Where extra materials of value remain after Final Acceptance by the Owner, they become the Owner's property.

END OF SECTION 017400

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.

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of the building.
2. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 011000 "Summary of Work" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 017300 "Execution" for cutting and patching procedures.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

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

1.5 INFORMATIONAL 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. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

1.6 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Scope of work does not include the removal of Hazardous Materials.

1. If suspected hazardous materials are encountered that are not indicated in the documents, do not disturb; immediately notify Architect and Owner.

E. Storage or sale of removed items or materials on-site is not permitted.

F. 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.

1.7 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with 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. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

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.

3.3 PREPARATION

A. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. 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. Verify use of cutting torches with COR prior to use. 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 fire watch and portable fire-suppression devices during flame-cutting operations. Maintain adequate ventilation when using cutting torches.
5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

6. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on existing conditions.
7. Dispose of demolished items and materials promptly.

B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Protect items from damage during transport and storage.
3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 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 064113 - WOOD-VENEER-FACED ARCHITECTURAL CABINETS

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. Architectural wood cabinets.
2. Wood furring, blocking, shims, and hanging strips for installing architectural wood cabinets unless concealed within other construction before cabinet installation.
3. Shop finishing of architectural wood cabinets.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product including panel products, fire-retardant-treated materials, cabinet hardware and accessories, and finishing materials and processes.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details full size.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for electrical switches and outlets and other items installed in architectural wood cabinets.
4. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
5. Apply AWI Quality Certification Program label to Shop Drawings.

C. Samples for Initial Selection:

1. Shop-applied transparent finishes.
2. PVC edge material.
3. Thermoset decorative panels.

D. Samples for Verification:

1. Lumber for transparent finish, not less than **5 inches (125 mm) wide by 12 inches (300 mm) long**, for each species and cut, finished on one side and one edge.

2. Veneer leaves representative of and selected from flitches to be used for transparent-finished cabinets.
3. Thermoset decorative panels, **8 by 10 inches (200 by 250 mm)** for each color, pattern, and surface finish **with edge banding on one edge**.
4. Corner pieces as follows:

    a. Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 18 inches (450 mm) high by 18 inches (450 mm) wide by 6 inches (150 mm) deep.
    b. Miter joints for standing trim.

5. Exposed cabinet hardware and accessories, one unit for each type **and finish**.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For **fabricator**.

B. Product Certificates: For **each type of product.**

C. Woodwork Quality Standard Compliance Certificates: **AWI Quality Certification Program certificates**.

D. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. **Shop is a certified participant in AWI's Quality Certification Program.**

B. Installer Qualifications: **Certified participant in AWI's Quality Certification Program**.

C. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

D. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups of **typical architectural wood cabinets as shown on Drawings**.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cabinets until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.

C. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that wood-veneer-faced architectural cabinets can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CABINET FABRICATORS

A. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of architectural wood cabinets with sequence-matched wood veneers **doors with face veneers that are sequence matched with woodwork and transparent-finished wood doors that are required to be of same species as woodwork**.

B. Fabricators: Subject to compliance with requirements.

2.2 ARCHITECTURAL WOOD CABINETS, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural wood cabinets indicated for construction, finishes, installation, and other requirements.

1. Provide **labels and certificates** from **AWI** certification program indicating that woodwork**, including installation,** complies with requirements of grades specified.
2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

2.3 WOOD CABINETS FOR TRANSPARENT FINISH

A. Grade: **Premium**.

B. Certified Wood: Wood cabinets for transparent finish shall be produced from wood certified as "FSC Pure" according to FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship," and FSC STD-40-004, "FSC Standard for Chain of Custody Certification."

C. Type of Construction: ligature resistant as indicated in the drawings.

D. Cabinet and Door and Drawer Front Interface Style: ligature resistant.

E. Wood for Exposed Surfaces:

1. Species: **Red oak**.
2. Cut: **Plain sliced/plain sawn**.
3. Grain Direction: **Vertically for drawer fronts, doors, and fixed panels**.
4. Matching of Veneer Leaves: **Book** match.
5. Veneer Matching within Panel Face: [**Running**] [**Balance**] [**Center-balance**] match.
6. Veneer Matching within Room: Provide cabinet veneers in each room or other space from a single flitch with doors, drawer fronts, and other surfaces matched in a sequenced set with continuous match where veneers are interrupted perpendicular to the grain.
7. Comply with veneer and other matching requirements indicated for blueprint-matched paneling.

F. Semiexposed Surfaces: Provide surface materials indicated below:

1. Surfaces Other Than Drawer Bodies: **Same species and cut indicated for exposed surfaces.**

    a. Edges of Thermoset Decorative Panel Shelves: PVC or polyester edge banding.

G. Dust Panels: 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers unless located directly under tops.

2.4 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.

B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Softwood Plywood: DOC PS 1**, medium-density overlay**.
2. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1[**, made with adhesive containing no urea formaldehyde**].

3. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.5 FIRE-RETARDANT-TREATED MATERIALS

A. Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

1. Use treated materials that comply with requirements of referenced woodworking standard. Do not use materials that are warped, discolored, or otherwise defective.
2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.

B. Fire-Retardant-Treated Lumber and Plywood: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent, respectively.
2. For items indicated to receive a stained or natural finish, use organic resin chemical formulation.
3. Mill lumber after treatment within limits set for wood removal that do not affect listed fire-test-response characteristics, using a woodworking shop certified by testing and inspecting agency.
4. Mill lumber before treatment and implement special procedures during treatment and drying processes that prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of treated woodwork.

2.6 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 087100 "Door Hardware (Descriptive Specification)."

B. Frameless Continuous Concealed Hinges (European Type): BHMA A156.9, B01602, **170** degrees of opening**, self-closing**.

C. Catches: **Magnetic catches, BHMA A156.9, B03141**

D. Adjustable Shelf Standards and Supports: **BHMA A156.9, B04071; with shelf rests, B04081**.

E. Shelf Rests: BHMA A156.9, B04013; **metal, two-pin type with shelf hold-down clip**.

F. Door Locks: BHMA A156.11, E07121.

G. Door Silencers: BHMA A156.16, L03011.

H. Tempered Float Glass for Cabinet Doors: ASTM C 1048, Kind FT, Condition A, Type I, **Class 1 (clear),** 6 mm thick unless otherwise indicated.

I. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

1. Dark, Oxidized, Satin Bronze, Oil Rubbed: BHMA 613 for bronze base; BHMA 640 for steel base; match Architect's sample.

J. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.7 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: **Fire-retardant-treated softwood lumber**, kiln dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

C. Adhesives: Do not use adhesives that contain urea formaldehyde.

D. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.8 FABRICATION

A. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

B. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

1. Corners of Cabinets: 1/16 inch (1.5 mm) unless otherwise indicated.

C. Complete fabrication, including assembly**, finishing,** and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check

measurements of assemblies against field measurements before disassembling for shipment.

D. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

E. Install glass to comply with GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

2.9 SHOP FINISHING

A. General: Finish architectural wood cabinets at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.

B. Shop Priming: Shop apply the prime coat including backpriming, if any, for **transparent-finished** items specified to be field finished.

C. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural wood cabinets, as applicable to each unit of work.

1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of cabinets.

D. Transparent Finish:

1. Grade: **Same as item to be finished**.
2. Staining: **Match approved sample for color**.
3. Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.
4. Filled Finish for Open-Grain Woods: **After staining, apply wash-coat sealer and allow to dry.** Apply paste wood filler and wipe off excess. Tint filler to match stained wood.
5. Sheen: **Satin, 31-45** gloss units measured on 60-degree gloss meter per ASTM D 523.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.

B. Before installing cabinets, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

A. Grade: Install cabinets to comply with same grade as item to be installed.

B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.

C. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

D. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails **or finishing screws** for exposed fastening, countersunk and filled flush with woodwork.

1. For shop finished items use filler matching finish of items being installed.

F. Cabinets: Install without distortion so 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 installation of hardware and accessory items as indicated.

1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
2. Maintain veneer sequence matching of cabinets with transparent finish.
3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with **No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into wood framing, blocking, or hanging strips.**

G. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.

1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean cabinets on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 064113

SECTION 081213 - HOLLOW METAL FRAMES

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 hollow-metal frames.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, and finishes.

B. Shop Drawings: Include the following:

1. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
2. Locations of reinforcement and preparations for hardware.
3. Details of each different wall opening condition.
4. Details of anchorages, joints, field splices, and connections.
5. Details of moldings, removable stops, and glazing.

C. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on the Drawings. Coordinate with Door Hardware.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of frame assembly, for tests performed by a qualified testing agency.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each unit to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Amweld International, LLC.
2. Ceco Door Products; an Assa Abloy Group company.
3. Curries Company; an Assa Abloy Group company.
4. DKS Steel Door & Frame Sys. Inc.
5. J/R Metal Frames Manufacturing, Inc.
6. Mesker Door Inc.
7. MPI Group, LLC (The).
8. Steelcraft; an Ingersoll-Rand company.

B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 INTERIOR FRAMES

A. Construct interior frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

A. Heavy-Duty Frames: SDI A250.8, Level 2.

1. Physical Performance: Level B according to SDI A250.4.
2. Materials: **Uncoated** steel sheet, minimum thickness of 0.053 inch (1.3 mm).
3. Construction: **Face welded**.
4. Exposed Finish: **Prime**.

2.3 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.4 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

2.5 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
2. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
3. Jamb Anchors: Provide number and spacing of anchors as follows:

a. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:

1) Three anchors per jamb up to 60 inches (1524 mm) high.
2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.

3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.

b. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:

1) Two anchors per jamb up to 60 inches (1524 mm) high.
2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.

4. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.

C. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce frames to receive nontemplated, mortised, and surface-mounted hardware.
2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

2.6 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

B. Finish Paint: Frames to be field finish painted to match existing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Drill and tap frames to receive nontemplated, mortised, and surface-mounted hardware.

3.3 INSTALLATION

A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
   a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
   b. Remove temporary braces necessary for installation only after frames have been properly set and secured.
   c. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

   a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.

4. In-Place Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.

6. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.

7. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

   a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
   b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.

c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081213

SECTION 081416 - FLUSH 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 doors with wood-veneer faces.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.

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.
4. Undercuts.
5. Requirements for veneer matching.
6. Doors to be factory finished and finish requirements.
7. Fire-protection ratings for fire-rated doors.

C. Samples for Initial Selection: For factory-finished doors.

D. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), for each material and finish.
2. Corner sections of doors, approximately 8 by 10 inches (200 by 250 mm), with door faces and edges representing actual materials to be used.

a. Provide Samples for each species of veneer and solid lumber required.
b. Provide Samples for each color, texture, and pattern of plastic laminate required.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is a certified participant in AWI's Quality Certification Program.

B. Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

1.8 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 and finishing 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. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Algoma Hardwoods, Inc.
2. Ampco.
3. Graham Wood Doors; an Assa Abloy Group company.
4. Marlite.

5. Marshfield Door Systems, Inc.
6. Mohawk Doors; a Masonite company.
7. Oshkosh Door Company.
8. Poncraft Door Company.

B. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards.

1. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.
2. Contract Documents contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.

B. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain urea formaldehyde.

C. WDMA I.S.1-A Performance Grade:

1. Heavy Duty unless otherwise indicated.

D. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252.

1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.

E. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.

F. Particleboard-Core Doors:

1. Particleboard: ANSI A208.1, Grade LD-2.
2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.

a. 5-inch (125-mm) top-rail blocking, in doors indicated to have closers.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:

1. Grade: Premium, with Grade A faces.
2. Species: Red oak.
3. Cut: Plain sliced.

4. Match between Veneer Leaves: Book.
5. Assembly of Veneer Leaves on Door Faces: Center-balance match.
6. Room Match: Provide door faces of compatible color and grain within each separate room or area of building.
7. Core: Particleboard.
8. Construction: Seven plies, either bonded or nonbonded construction.
9. WDMA I.S.1-A Performance Grade: Heavy Duty.

2.4 LIGHT FRAMES

A. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch- (1.2-mm-) thick, cold-rolled steel sheet; factory primed for paint finish; and approved for use in doors of fire-protection rating indicated.

2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

1. Comply with NFPA 80 requirements for fire-rated doors.

B. 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.

2.6 FACTORY FINISHING

A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.

B. Factory finish doors.

C. Transparent Finish:

1. Match existing standard facility doors.

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.
2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

1. Install fire-rated doors according to NFPA 80.
2. Install smoke- and draft-control doors according to NFPA 105.

C. 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 fire-rated 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.

    a. Comply with NFPA 80 for fire-rated doors.

2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
3. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock edge; trim stiles and rails only to extent permitted by labeling agency.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

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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 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Mechanical door hardware for the following:

a. Existing swinging doors.
b. New swinging doors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples: Provide a full-size sample of all hardware indicated in the schedule for facility review/approval prior to ordering and installing all quantities.

C. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
b. Format: Use same scheduling sequence and format and use same door/room numbers as in the Contract Documents.
c. Content: Include the following information:

1) Identification number, location, hand, fire rating, size, and material of each door and frame.
2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
4) Fastenings and other pertinent information.
5) Explanation of abbreviations, symbols, and codes contained in schedule.

6) Mounting locations for door hardware.
7) List of related door devices specified in other Sections for each door and frame.

2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

C. Warranty: Special warranty specified in this Section.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware schedule.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

B. Source Limitations: Obtain each type of door hardware from a single manufacturer.

C. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

D. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:

   a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.

3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.

E. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

1.8 COORDINATION

A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

B. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of doors and door hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.
2. References to BHMA Designations: Provide products complying with these designations and requirements for description, quality, and function.

2.2 CONTINUOUS HINGES

A. Continuous Hinges: BHMA A156.26; minimum 0.120-inch thick, hinge leaves with minimum overall width of 4 inches; fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete.

B. Pin-and-Barrel-Type Hinges:

1. Provide Hospital tips to meet anti-ligature requirements.

2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Pemco
b. IVES Hardware; an Ingersoll-Rand company.
c. McKinney Products Company; an ASSA ABLOY Group company.
d. Stanley Commercial Hardware; Div. of The Stanley Works.
e. Or Approved Equal.

2.3 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: As indicated in door hardware schedule.

B. Integrated Lever: Mortise, BHMA A156.13; Grade 1; standard mortise lock with integrated lever and escutcheon combination on both sides of door to meet anti-ligature requirements.

1. Manufacturers (Sole Sourced):

a. BEST

2.4 OVERHEAD CLOSERS

A. Conform to ANSI A156.4, Grade 1

B. Closers shall conform to the following:
1. The closer shall have minimum 50 percent adjustable closing force over minimum value for that closer and have adjustable hydraulic back check effective between 60 degrees and 85 degrees of door opening.
2. Where specified, closer shall have hold-open feature.
3. Size Requirements: Provide multi-size closers, sizes 1 through 6, except where multi-size closer is not available for the required application.

4. Material of closer body shall be forged or cast.
5. Arm and brackets for closers shall be steel, malleable iron or high strength ductile cast iron.
6. Closers shall have full size metal cover; plastic covers will not be accepted.
7. Closers shall have adjustable hydraulic back-check, separate valves for closing and latching speed, adjustable back-check positioning valve, and adjustable delayed action valve.
8. Provide closers with any accessories required for the mounting application, including (but not limited to) drop plates, special soffit plates, spacers for heavy-duty parallel arm fifth screws, bull-nose or other regular arm brackets, longer or shorter arm assemblies, and special factory templating. Provide special arms, drop plates, and templating as needed to allow mounting at doors with overhead stops and/or holders.
9. Closer arms or backcheck valve shall not be used to stop the door from overswing, except in applications where a separate wall, floor, or overhead stop cannot be used.
10. Provide parallel arm closers with heavy duty rigid arm.
11. Where closers are to be installed on the push side of the door, provide parallel arm type except where conditions require use of top jamb arm.
12. Provide all surface closers with the same body attachment screw pattern for ease of replacement and maintenance.
13. All closers shall have a 1 ½" (38mm) minimum piston diameter.

C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. LCN Door Closers
2. Hager
3. Norton Rixson
4. Or Approved Equal

2.5 MAGNETIC HOLD-OPEN/DOOOR STOPPER DEVICES

A. Magnetic Door Holders: BHMA A156.15, Grade 1; floor-mounted magnetic single unit with strike plate attached to swinging door.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Mag-Mate D3X1BKT Magnetic Door Holder
2. Industrial Magnetics
3. Rockwood
4. Rixon

2.6 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."

2.7 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

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 are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's 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. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated.

3.4 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.

B. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DOOR HARDWARE SCHEDULE

END OF SECTION 087100

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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 gypsum board assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

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, according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
2. Protective Coating: ASTM A 653/A 653M, G40 (Z120) hot-dip galvanized unless otherwise indicated.

B. Studs and Runners: ASTM C 645.

1. Steel Studs and Runners:

a. Minimum Base-Metal Thickness: As indicated on Drawings.
b. Depth: As indicated on Drawings

C. Slip-Type Head Joints: Where indicated, provide the following:

1. Deflection Track: Steel sheet top runner 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. Products: Subject to compliance with requirements, provide one of the following:

1) Dietrich Metal Framing; SLP-TRK Slotted Deflection Track.
2) MBA Building Supplies; FlatSteel Deflection Track.
3) Steel Network Inc. (The); VertiClip SLD Series.
4) Superior Metal Trim; Superior Flex Track System (SFT).
5) Telling Industries; Vertical Slip Track.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal 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 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.3 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Single-Layer Application: 16 inches (406 mm) unless otherwise indicated.
2. 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 (runners) 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 penetrating 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 runner 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.

E. 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

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SECTION 092900 - GYPSUM BOARD

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. Interior gypsum board.
2. Tile backing panels.

B. Related Requirements:

1. Section 092216 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. American Gypsum.
2. CertainTeed Corp.
3. Georgia-Pacific Gypsum LLC.
4. National Gypsum Company.
5. USG Corporation.

B. Gypsum Wallboard: ASTM C 1396/C 1396M.

1. Thickness: 1/2 inch (12.7 mm) abuse resistant.
2. Long Edges: Tapered.

C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.

1. Thickness: 1/2 inch (12.7 mm).
2. Long Edges: Tapered.

2.3 BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or 1325, with manufacturer's standard edges.

1. Products: Subject to compliance with requirements, provide one of the following:

a. C-Cure; C-Cure Board 990.
b. CertainTeed Corp.; FiberCement BackerBoard.
c. National Gypsum Company, Permabase Cement Board.
d. USG Corporation; DUROCK Cement Board.

2. Thickness: 1/2 inch (12.7 mm).
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet
2. Shapes:

    a. Cornerbead.
    b. Bullnose bead.
    c. LC-Bead: J-shaped; exposed long flange receives joint compound.
    d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
    e. Expansion (control) joint.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Fry Reglet Corp.
    b. Gordon, Inc.
    c. Pittcon Industries.

2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
3. Finish: corrosion-resistant primer compatible with joint compound and finish materials specified.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

    a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.
5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

D. Joint Compound for Tile Backing Panels:

1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.

2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Wallboard Type: ½" Abuse resistant.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.

3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners unless otherwise indicated.
2. Bullnose Bead: Use at outside corners.
3. LC-Bead: Use at exposed panel edges.
4. U-Bead: Use at exposed panel edges.

3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

    a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.6 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 095123 - ACOUSTICAL TILE CEILINGS

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. Acoustical tiles for ceilings.
2. Concealed suspension systems.

B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.

1. Acoustical Tile: Set of full-size Samples of each type, color, pattern, and texture.
2. Concealed Suspension-System Members: 6-inch long Sample of each type.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical tiles, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical tiles, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical tiles carefully to avoid chipping edges or damaging units in any way.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical tile ceilings 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 the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 50 or less.

2.2 ACOUSTICAL TILES, GENERAL

A. Source Limitations: Obtain each type of acoustical ceiling tile and supporting suspension system from single source from single manufacturer.

B. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

C. Acoustical Tile Colors and Patterns: Match appearance characteristics indicated for each product type.

2.3 ACOUSTICAL TILES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. USG Corporation
2. Armstrong World Industries
3. CertainTeed

B. Color: White

C. LR: Not less than 0.80.

D. NRC: Not less than 0.50.

E. CAC: Not less than 35.

F. Edge/Joint Detail: SLT

G. Thickness: 5/8 inch

H. Modular Size: 24 by 24 inches

I. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical tiles treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

2.4 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension-System Standard: Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.

B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.135-inch- diameter wire.

D. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch diameter bolts.

E. Seismic Struts: Manufacturer's standard compression struts designed to accommodate lateral forces.

F. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical tiles in-place.

2.5 METAL SUSPENSION SYSTEM

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. USG Corporation
2. Armstrong World Industries
3. CertainTeed
4. Chicago Metallic

2.6 METAL EDGE MOLDINGS AND TRIM

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. USG Corporation
2. Armstrong World Industries
3. CertainTeed
4. Chicago Metallic

B. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations complying with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

1. Provide manufacturer's standard edge moldings that fit acoustical tile edge details and suspension systems indicated and that match width and configuration of exposed runners unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.

2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
8. Do not attach hangers to steel deck tabs.
9. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical tile ceiling area and where necessary to conceal edges of acoustical tiles.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension-system flanges into kerfed edges so tile-to-tile joints are closed by double lap of material.

1. Fit adjoining tile to form flush, tight joints. Scribe and cut tile for accurate fit at borders and around penetrations through tile.
2. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.4 CLEANING

A. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095123

SECTION 097700 - SPECIAL WALL SURFACING - FRP PANELS

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. Fiberglass reinforced plastic (FRP) panels for wall applications.

B. Related Requirements:

1. Section 092900 “Gypsum Board” for backing board.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer’s product data, including installation instructions.

B. Samples: Submit manufacturer’s colors and finishes.

C. Manufacturer’s Certification: Submit manufacturer’s certification that materials comply with specified requirements and are suitable for intended application.

D. Warranty Documentation: Submit manufacturer’s standard warranty.

E. Sustainable Construction Submittals:

1. Low Pollutant-Emitting Materials: Show volatile organic compound types and quantities.

F. Operation and Maintenance Data:

1. Care instructions for each exposed finish product.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Regularly and presently manufactures specified products.
2. Manufactures specified products with satisfactory service on five similar installations for minimum five years.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver products in manufacturer's original sealed packaging.

B. Store and handle in strict compliance with manufacturer’s instructions and recommendations.

C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

D. Store products indoors in dry, weathertight conditioned facility.

E. Protect products from damage during handling and construction operations.

PART 2 - PRODUCTS

2.1 FIBERGLASS REINFORCED PLASTIC PANELS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Marlite
2. Panolam
3. Kal-Lite
4. Nudo

2.2 FIBERGLASS REINFORCED PLASTIC PANELS

A. Surface Texture: Smooth

B. Fire Rating ASTM 84: Class A

C. Sustainability, Indoor Air Quality: GREENGUARD Gold Certification

D. Thickness: 0.090 inches

E. Barcol Hardness: ASTM D2583: 35 typical

F. Water Absorption ASTM D570: 0.2 percent typical

G. Accessories: Color matched dividers, outside corners, inside corners, end caps and fastening rivets.

H. Adhesive: As recommended by manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Verify dimensions.

C. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

A. Install products in strict accordance with manufacturer's instructions and approved submittals.

1. Clean substrate of dirt, dust, waxes, and other bond breaking substances prior to beginning installation.
2. Install panels with bottom edge located to clear top of resilient base.
3. Apply adhesive uniformly using adhesive manufacturers recommended trowel to the entire back of panels completely to the edge (100% coverage).
4. Lay FRP panels in place leaving approximately 1/8 inch between panels and 1/4 inch space top and bottom.
5. Follow adhesive manufacturer's recommendations for set and application times.
6. Apply pressure to entire panel face with laminate type roller, removing trapped air and ensure proper adhesion between surfaces.

3.3 ADJUSTING AND CLEANING

A. Replace installations out of plumb and not aligned with adjacent panels and construction.

B. Clean panel face to remove soiling, stains, dust, and dirt using clean rags, and cleaning agents as instructed by manufacturer.

C. Leave installation clean, free of residue and debris resulting from work of this section.

END OF SECTION 097700

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SECTION 099123 - INTERIOR PAINTING

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 surface preparation and the application of paint systems on interior substrates.

1. Concrete masonry units (CMU).
2. Gypsum board.

1.3 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of topcoat product.

C. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas.

2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.
3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials from the same product run**,** that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Valspar
2. Behr Process Corporation
3. Benjamin Moore & Co.
4. ICI Paints.
5. PPG Architectural Finishes, Inc.
6. Sherwin-Williams Company (The).

B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles for the paint category indicated.

2.2 PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24)].

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 150 g/L.
3. Primers, Sealers, and Undercoaters: 200 g/L.
4. Zinc-Rich Industrial Maintenance Primers: 340 g/L.

D. Colors: Match existing.

2.3 PAINT AND PRIMER

A. Paint and Primer: Acrylic Latex

2.4 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Masonry (Clay and CMU): 12 percent.
2. Gypsum Board: 12 percent.
3. Plaster: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

A. CMU Substrates:

1. Latex System:

a. Block Filler: Block filler, latex, interior, MPI #4.
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, match existing gloss level of adjacent partitions.
d. Color: Match existing.

B. Gypsum Board Substrates:

1. Latex System:
a. Prime Coat: Latex, interior matching topcoat.
b. Intermediate Coat: Latex, interior matching topcoat.
c. Topcoat: Latex, interior, match existing gloss level of adjacent partitions.
d. Color: Match existing.

C. Hollow Metal Door Frames:

1. Latex System:
a. Prime Coat: Shop primer
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, match existing gloss level of adjacent door frames.
d. Color: Match existing.

END OF SECTION 099123

SECTION 104400 - FIRE PROTECTION SPECIALTIES (ALTERNATE #1)

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. Fire Hose Cabinet

1.3 REFERENCES

A. NFPA
B. ADA Accessibility Guidelines
C. UBC Standard 7-5 (ASTM E-814-83)

1.4 ACTION SUBMITTALS

A. Product Data:

   1. Include construction details, material descriptions, dimensions, profiles, hardware and finishes.

B. Shop Drawings:

   1. Include plans, elevations, sections, details and attachments to existing conditions.

PART 2 - PRODUCTS

2.1 FIRE HOSE CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   1. Basis of Design: Larsen DHC 2634, recessed cabinet with solid door, anti-ligature continuous hinge, and recessed keyed lock. Door and trim to be fabricated from cold-rolled steel.
   2. National Fire
   3. American Fire Supply

B. Recessed steel cabinet for maximum security.

C. Solid door with anti-ligature continuous hinge and recessed security lock.

D. Hose rack and valve to match existing.

E. Lettering on door to indicate Fire Hose Connection.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that rough openings for cabinets are correctly sized and located.

B. Field verify existing conditions for installation.

3.2 INSTALLATION

A. Install in strict accordance with the approved shop drawings and requirements of agencies having jurisdiction, anchoring all components firmly into position.

END OF SECTION 104400

SECTION 105113 - METAL LOCKERS (ALTERNATE #2)

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. Standard Duty Knocked Down Lockers

1.3 REFERENCES

A. ADAAG – American with Disabilities Act, Accessibility Guidelines

1.4 ACTION SUBMITTALS

A. Product Data: For each type of metal locker.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker.

B. Shop Drawings: For metal lockers.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Show locker trim and accessories.
3. Include locker identification system and numbering sequence.

C. Samples for Initial Selection: Manufacturer’s color charts showing the full range of colors available.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions by field measurements before fabrication.

1.9 COORDINATION

A. Coordinate sizes and locations of bases for metal lockers.

B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.

1. Failures include, but are not limited to, the following:

    a. Structural failures.
    b. Faulty operation of latches and other door hardware.

2. Damage from deliberate destruction and vandalism is excluded.
3. Warranty Period for Knocked-Down Metal Lockers: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain metal lockers and accessories from single source from single locker manufacturer.

1. Obtain locks from single lock manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Lockers to meet ADA and Joint Commission Ligature Resistant requirements.

2.3 LOCKERS

A. Products: Subject to compliance with requirements, provide one of the following:

1. Basis-of-Design: Pemco, Vanguard 5-tier box locker (30 total), solid doors, recessed ligature resistant handle, continuous ligature resistant hinge, sloped top and solid base.

2. Approved Equal.

B. Doors: One piece; fabricated from 16-gauge to 18-gauge sheet steel; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.

1. Doors less than 20 inches high (box lockers) are to be fabricated from 18-gauge steel sheet.
2. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches (381 mm) wide; welded to inner face of doors.
3. Stiffeners: Manufacturer's standard full-height stiffener fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet; welded to inner face of doors.
4. Door Style: Unperforated panel.

C. Body: Steel specially formed for added strength and rigidity and to ensure tight joints at fastening points.

1. Tops and bottoms with four sides formed 90 degrees, the front offset formed to be flush with horizontal frame member.

2. Shelves with four sides formed to 90 degrees, front edge having a second bend.

3. Form door frame members to a channel shape, not less than 16-gauge steel.

4. Provide vertical door frame members with additional 3/8 inch (9.5 mm) flange as a continuous door strike.

5. Securely weld cross frame members of channel shapes to vertical framing members to ensure rigidity, including intermediate cross frame on double and triple tier lockers.

6. Factory assembly of locker bodies using rivets.

7. Center partitions: 24-gauge steel vertical partitions, full depth between bottom and shelf.

D. Hinges: Continuous hinges the full height of the door with ligature resistant slopes tips.

E. Projecting Door Handle and Latch: Finger-lift latch control designed for use with either built-in combination locks or padlocks; positive automatic latching, chromium plated; pry and vandal resistant.

1. Latch Hooks: Equip doors 48 inches (1219 mm) and higher with three latch hooks and doors less than 48 inches (1219 mm) high with two latch hooks; fabricated from 0.105-inch (2.66-mm) nominal-thickness steel sheet; welded or riveted to full-height door strikes; with resilient silencer on each latch hook.
2. Latching Mechanism: Manufacturer's standard, rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact, and incorporating a prelocking device that allows locker door to be locked while door is open and then closed without unlocking or damaging lock or latching mechanism.

F. Recessed Door Handle and lock to meet ligature resistant requirements.

G. Continuous Sloping Tops: Fabricated from manufacturer's standard thickness, but not less than 0.036-inch (0.91-mm) nominal-thickness steel sheet.

1. Closures: Hipped-end type.
2. Sloping-top corner fillers, mitered.

H. Filler Panels: Fabricated from manufacturer's standard thickness, but not less than 0.036-inch (0.91-mm) nominal-thickness steel sheet.

I. Boxed End Panels: Fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet.

J. Finished End Panels: Fabricated from 0.024-inch (0.61-mm) nominal-thickness steel sheet.

K. Center Dividers: Fabricated from 0.024-inch (0.61-mm) nominal-thickness steel sheet.

L. Base: Solid base to match locker system, fabricated from .036-inch nominal-thickness steel sheet.

M. Materials:

1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.

N. Finish: Baked enamel or powder coat.

1. Color: As selected by Architect from manufacturer's full range.

2.4 LOCKS

A. Cylinder Locks: Built-in, flush, cam locks with five-pin tumbler keyway, keyed separately and master keyed. Furnish two change keys for each lock and two master keys.

1. Key Type: Grooved, with minimum 2- by 2.68-inch (51- by 68.3-mm) key head for accessible lockers.
2. Bolt Operation: Manually locking deadbolt.

2.5 FABRICATION

A. Fabricate metal lockers square, rigid, without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.

1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.

B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments. Factory weld frame members of each metal locker together to form a rigid, one-piece assembly.

C. Equipment: Provide each locker with an identification plate and the following equipment.

D. Continuous Base: Formed into channel or zee profile for stiffness, and fabricated in lengths as long as practical to enclose base and base ends of metal lockers; finished to match lockers.

E. Continuous Sloping Tops: Fabricated in lengths as long as practical, without visible fasteners at splice locations; finished to match lockers.

1. Sloping-top corner fillers, mitered.

F. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.

G. Boxed End Panels: Fabricated with 1-inch- (25-mm-) wide edge dimension, and designed for concealing fasteners and holes at exposed ends of nonrecessed metal lockers; finished to match lockers.

H. Finished End Panels: Designed for concealing unused penetrations and fasteners, except for perimeter fasteners, at exposed ends of nonrecessed metal lockers; finished to match lockers.

1. Provide one-piece panels for double-row (back-to-back) locker ends.

I. Center Dividers: Full-depth, vertical partitions between bottom and shelf; finished to match lockers.

2.6 ACCESSORIES

A. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.

B. Anchors: Material, type, and size required for secure anchorage to each substrate.

1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls for corrosion resistance.
2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install lockers level, plumb, and true; shim as required, using concealed shims.

1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
2. Anchor single rows of metal lockers to walls near top and bottom of lockers.

B. Knocked-Down Lockers: Assemble with standard fasteners, with no exposed fasteners on door faces or face frames.

C. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.

1. Attach recess trim to recessed metal lockers with concealed clips.
2. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
3. Attach sloping-top units to metal lockers, with closures at exposed ends.
4. Attach boxed end panels using concealed fasteners to conceal exposed ends of nonrecessed metal lockers.
5. Attach finished end panels using fasteners only at perimeter to conceal exposed ends of nonrecessed metal lockers.

3.3 ADJUSTING

A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding.

3.4 PROTECTION

A. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.

B. Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 105113

SECTION 220500 - PLUMBING GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General requirements applicable to all Division 22 Sections.

1.2 DEFINITIONS

A. A/E: Project Architect and/or Engineer.

B. Furnish: To purchase/supply.

C. Install: To place in position and connect complete ready for use.

D. Provide: To furnish and install.

1.3 GENERAL

A. The contract drawings are a diagrammatic representation of the design intent. They do not show every component required for a complete and operational system. The Contractor shall install complete and operational systems based on the design intent.

B. The installation shall comply with the contract documents, applicable codes, manufacturer's installation recommendations, published Owner standards, utility company requirements, and requirements of the AHJ.

1. Notify the A/E in writing of any discrepancies in the contract documents and any of the authorities listed above prior to submitting a bid.
2. If there is a discrepancy between manufacturer's installation recommendations and the contract documents, the manufacturer's recommendations shall take precedence.
3. If there are conflicting requirements in the contract documents, the more restrictive requirement shall govern.

C. Contractor shall apply, procure, and pay for required permits, licenses, inspections, and any other fees.

1.4 EXAMINATION OF CONTRACT DOCUMENTS

A. The drawings show the design intent diagrammatically. They do not show the exact routing nor every elbow, offset, etc. Do not scale the drawings. The Contractor shall determine the exact installed locations and routing to achieve the design intent. The cost of reasonable adjustments to locations and routing shall be included in the bid. The Contractor shall visit the project site prior to submitting a bid to confirm existing conditions and new work plan of action.

B. Where discrepancies in quantities or sizes exist in the contract documents the greater number shall govern.

C. Verify all dimensions at the jobsite prior to ordering any materials.

1.5 SUBMITTALS

A. Submittals shall be required if requested in applicable specification section or drawings. Submittals will not be reviewed by engineer for specific products if they are not requested in the contract documents.

B. Contractor shall provide separate submittal packages for each specification section. Submittals including multiple specification sections are not acceptable. All items within an individual specification section shall be provided within a single submittal. Providing multiple submittals for a single specification section is not acceptable unless the project has multiple phases.

C. Submittals shall be in PDF format. File name shall include the specification number and description of the submitted item.

D. Content Requirements:

1. Each submittal shall include a cover sheet containing date, project name and number, contractor's name and address, specification number, items submitted, deviations from contract documents, and a blank space for review stamps.
2. Submitted items that have a scheduled equipment tag number on the contract documents shall bear such tag number in the submittal to clearly identify submitted item.
3. Selected options such as model, material, finish, etc. shall be clearly identified.
4. Contractor shall provide review stamp on each submittal, including name of reviewer and date, indicating the content in the submittal has been thoroughly reviewed for completeness and accuracy prior to submitting.
5. Clearly identify deviations, if any, from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.

E. Submittals shall be approved by the A/E prior to ordering items. Approval of submittals does not relieve the contractor's obligation to comply with the contract documents.

F. The A/E reserves the right to invoice the Contractor for time spent for multiple reviews of submittals that are the result of incomplete, inaccurate, or noncompliant submittals being rejected.

1.6 MATERIAL SUBSTITUTION

A. The Contractor may submit a request for a material substitution for any item made by a manufacturer not listed as an approved manufacturer in the applicable specification. The

request shall include enough information for the A/E to determine if the substituted item is of equal or better performance and quality than that listed in the contract documents.

B. Material substitution requests shall be submitted no later than the last day for pre-bid RFIs.

C. If a material substitution request is not submitted on time, the Contractor may include the substitution as a voluntary substitution on the bid form. Such substitutions will not be considered in determining the low bidder.

D. The Contractor that submitted the material substitution is responsible for any additional costs incurred by other Contractors as a result of the alternate product.

1.7 VALUE ENGINEERING

A. If material or design changes are proposed during construction in an effort to save costs and the Owner agrees to the changes, the Contractor shall pay the design team on a time and material basis to address engineering modifications required.

1.8 WARRANTY

A. Provide a minimum of one-year parts and labor warranty for all fixtures, equipment, components, materials, and workmanship. Longer warranties may be required for certain systems as noted in other specification sections.

B. The warranty period shall start on the date of final acceptance by the Owner. If a newly installed system or piece of equipment is needed to operate the building during construction, the Contractor may agree to a warranty period start date with the Owner that begins prior to the final acceptance of the overall project. The Contractor shall obtain such an agreement in writing from the Owner's Representative.

C. The Contractor shall adjust the systems at seasonal changes, as needed, during the one-year warranty period to prove satisfactory operation during all seasons.

1.9 CHANGE ORDERS

A. Submit a detailed material and labor takeoff for each change order. Identify cost additions and credits based on revised scope. Material costs and required labor hours shall closely align with reputable cost estimating publications. Change orders lacking sufficient breakdown of costs and supporting documentation will be rejected.

B. Do not proceed with change order work until authorized.

PART 2 PRODUCTS

2.1 NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

A. The Contractor is solely responsible for jobsite safety.

B. Work shall be completed by individuals qualified and competent in that specific task.

C. Work that will produce excessive noise shall be completed during unoccupied hours. Coordinate schedule of noisy operations with the Owner's Representative.

D. Install equipment, devices, and components with sufficient clearance to easily maintain parts. Review the final location of equipment with the Owner's Representative prior to setting equipment.

E. Provide factory or field-supplied guard to protect personnel from coming into contact with rotating equipment components.

F. Provide temporary power as needed to support construction activities. Remove temporary power when no longer needed.

G. Thoroughly clean entire project site prior to final turnover to the Owner.

3.2 PRODUCT HANDLING AND STORAGE

A. The Contractor shall review the required path of travel to navigate equipment, devices, materials, etc. to and from the project area prior to submitting a bid. Overcoming any obstacles shall be accounted for in the bid.

B. Carefully transport and store equipment, devices, materials, etc. to prevent damage. The Contractor shall replace damaged items at no additional cost.

C. Paint equipment and devices that are scratched prior to Owner's acceptance. Paint type and color shall match original.

3.3 EXCAVATION AND BACKFILL

A. The Contractor shall visit the site and confirm existing surface types prior to submitting a bid.

B. The Contractor shall verify all underground utility locations with the local utility locator prior to starting any excavation.

C. Do not damage structure, equipment, or utilities when performing excavation. Be careful to not undermine the foundation.

D. When trenches are made below existing concrete the Contractor shall provide neat saw cuts with clean edges. Remove portions of demolished concrete from the site.

E. Provide, operate, and remove dewatering pumps and piping, as needed, to keep water out of trenches. Protect excavation against frost, as needed.

F. Dispose of excess excavated soil. Restore surfaces to their original condition.

G. Backfill trenches as soon after inspection as practicable.

1. Backfill material below pipe/conduit and up to 6" above pipe/conduit shall be imported sand consisting of natural or manufactured granular material. Material shall be free of deleterious amounts of organic material, mica, loam, and clay, and shall have a sand equivalent (SE) of 30 or greater with the following gradation: 100% shall pass through a 3/8" sieve, 95% shall pass through a No. 4 sieve, 30% shall pass through a No. 30 sieve, and 5% shall pass through a No. 200 sieve.
2. Backfill material 6" above pipe/conduit and higher shall be sand, CA6, or clean earth. Material shall be free of stones 4" and larger, cinder fill, frozen earth, construction debris, or other material that will damage the pipe/conduit.
3. Pipe/conduit shall be placed on a 6" bedding layer followed by additional layers not to exceed 6" high per layer. All layers shall be compacted to 95% of the maximum density. Moisture content of backfill shall not exceed +2% of the optimum moisture content. Precaution shall be taken to ensure compactness of backfill around piping without damage to such piping/conduit.
4. Provide 6” of topsoil where disturbed areas are to be seeded or sodded.

3.4 OCCUPIED BUILDING UNDER CONSTRUCTION IAQ

A. Coordinate IAQ plan with Owner’s Representative throughout construction.

B. The Contractor shall take steps necessary, including those in SMACNA IAQ Guidelines for Occupied Buildings Under Construction, to minimize construction dust/contaminants in order to limit the impact to the air quality of the adjacent occupied areas.

C. Construction activities that produce excessive dust shall be completed during unoccupied hours.

D. The construction site entrance shall not go through the existing building, if possible.

E. Adhesives and sealants shall be tested and compliant with applicable low emitting materials limits.

3.5 A/E JOBSITE OBSERVATIONS

A. The Contractor shall provide one full week notice to the A/E prior to making utility installation inaccessible to allow for visual observation of installed work by A/E. Such actions include backfilling over underground utilities or closing walls or ceilings containing utilities.

B. By notifying the A/E that the underground, above ceiling, or in wall work is ready for observation, the Contractor is certifying that such work is complete and does not require additional work. This includes, but is not limited to, hangers, supports, insulation, identification, and sealed penetrations. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.

C. IMPORTANT: Astral Engineers must observe the installation of their portion of the design. If observation of such installation is prevented due to the work being covered by backfill, walls, ceilings, etc. prior to observation by Astral Engineers, the Contractor will be required to expose the work so it can be adequately observed.

D. By notifying the A/E that the construction is complete and ready for the final jobsite observation, the Contractor is certifying that such work is complete and does not require additional work. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.

E. Astral Engineers will issue a jobsite observation report after each site visit noting any installation deficiencies, if any. The Contractor shall fix all deficiencies to the satisfaction of the A/E. Provide photographic and/or video evidence of corrected deficiencies signed off if requested by the A/E. The construction schedule shall account for these site visits and required corrections. Schedule extensions will not be allowed to accommodate A/E jobsite observations.

3.6 SYSTEM STARTUP AND TURNOVER

A. The Contractor shall perform complete system startup, calibration, testing, adjusting, and balancing. Refer to manufacturer startup procedures.

B. All operating conditions, control sequences, interlocks, and alarms shall be tested during the startup process.

C. Contractor shall provide verbal and written training for the Owner's representatives regarding the complete maintenance and operation requirements for all systems. Manufacturer personnel shall provide such instruction for major equipment and systems.

3.7 PROJECT CLOSEOUT

A. Operation and Maintenance Manuals:

1. Email a bookmarked electronic copy of the O&M manuals in PDF format to the A/E. All text shall be searchable.
2. Provide the Owner a copy of the O&M manuals on disc or flash drive. Disc or flash drive shall be labeled with project name and "O&M Manual".
3. Content Requirements:
    a. Provide title page with the project name, Architect, Engineers, Contractors, and major equipment suppliers. Include a point of contact for each entity with telephone numbers and email addresses.
    b. Provide table of contents with hyperlinks to content within document.
    c. Provide parts lists, wiring diagrams, control diagrams, operating procedures, and maintenance schedule and procedures for all systems.
    d. Provide all approved submittals, testing reports, equipment startup reports, factory inspection reports, and warranties.
    e. Group submittals and other supplemental information with the associated O&M manual to maintain a neat and organized document.

B. Record Documents:

1. The Contractor shall clearly markup drawings to indicate equipment, device, component, and/or utility actual installed location and size. Provide such marked up as-built drawings to A/E at the completion of construction.
2. The Contractor shall clearly markup specifications to indicate any changes to contract specifications based on actual installed conditions. Provide such marked up specifications to A/E at the completion of construction.

END OF SECTION 220500

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SECTION 220505 - PLUMBING DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selective demolition.

B. Patching.

1.2 QUALITY ASSURANCE

A. Demolition firm shall be a company specializing in the type of work required with a minimum of five years of documented experience.

PART 2 PRODUCTS

2.1 NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

A. The drawings are diagrammatic and do not show every pipe, fitting, accessory, etc. required to be removed. The Contractor shall visit the site prior to bid submission to verify all field conditions.

B. Comply with other requirements specified in Divisions 01 and 02.

C. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Comply with applicable requirements of NFPA 241.
2. Use of explosives is not permitted.
3. Provide, erect, and maintain temporary barriers and security devices.
4. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
6. Do not close or obstruct roadways or sidewalks without a permit.
7. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

D. Do not begin removal until built elements to be salvaged or relocated have been removed, vegetation to be relocated has been removed, measures have been taken to protect existing conditions to remain, and the Contractor has received notification to proceed from the Owner.

E. Protect existing structures and other elements that are not to be removed.

1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

F. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. Install temporary filters over outside air intakes within 100' of the construction area. If construction activities result in debris affecting existing to remain systems, the Contractor shall completely clean such systems.

H. If hazardous materials are discovered during removal operations, stop work and notify A/E and Owner's Representative. Hazardous materials include regulated asbestos containing materials, lead, polychlorinated biphenyls, and mercury.

I. Removal of hazardous materials shall comply with 29 CFR 1926 and state and local regulations.

J. Perform demolition in a manner that maximizes salvage and recycling of materials.

1. Dismantle existing construction and separate materials.
2. Set aside reusable, recyclable, and salvageable materials. Store and deliver to collection point or point of reuse.

3.2 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify applicable utility companies before starting work and comply with their requirements.

B. Protect existing utilities to prevent damage.

C. Do not disrupt public utilities without permission from the AHJ.

D. Do not close, shut off, or disrupt existing systems that are in use without at least two weeks prior written notification to Owner's Representative.

E. Remove piping, valves, meters, equipment, hangers, supports, and foundations of disconnected and abandoned utilities.

F. Patch holes resulting from the removal of existing utilities to match existing construction. Provide firestopping as required in fire-rated walls.

3.3 SELECTIVE DEMOLITION

A. Drawings showing existing construction and utilities are based on nondestructive field observation and existing record documents only.

1. Verify that construction and utility arrangements are as indicated.
2. Report discrepancies to A/E before disturbing existing installation.
3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied. Provide, erect, and maintain temporary dustproof, sound retardant partitions separating the construction area and adjacent occupied spaces.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications. Take care to prevent water and humidity damage.

D. Remove existing systems and equipment as indicated and as required to accomplish new work.

1. Existing systems that serve areas outside of the construction area shall remain active. Maintain access to equipment and operational components. Where existing systems must be shut off to allow for new connections, provide at least two weeks prior written notification to the Owner's Representative.
2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
3. Verify that abandoned services serve only abandoned facilities before removal.
4. Remove abandoned equipment, pipes, conduits, controls, and associated hangers, supports, accessories, etc. including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification. Domestic water pipes shall be less than 2' from the main to prevent dead legs.
5. Temporarily cap sanitary and vent pipes to prevent odors escaping from the pipe.

E. Protect existing work to remain.

1. Perform cutting to accomplish removals neatly and as specified for cutting new work.
2. Repair adjacent construction and finishes damaged during removal work.
3. Patch as specified for patching new work.

3.4 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove all materials not to be reused from site.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 220505

SECTION 220719 - PLUMBING PIPING INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Piping insulation.

B. Jacketing.

1.2 SUBMITTALS

A. See Section 22 0500 – Plumbing General Requirements for submittal procedures.

B. Provide product description, thermal characteristics, list of materials and thickness for each service and location.

C. Submit manufacturer's installation instructions. Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.3 QUALITY ASSURANCE

A. Manufacturer shall be a company specializing in manufacturing the products specified in this section with a minimum of three years of documented experience.

B. Installer shall be a company specializing in performing the type of work specified in this section with a minimum of five years of documented experience and approved by the the manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.5 FIELD CONDITIONS

A. Maintain ambient conditions required by manufacturers of each product.

B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.1 GENERAL

A. Provide required accessories in accordance with and subject to the recommendations of the insulation manufacturer.

B. All pipe insulation components and assemblies installed indoors shall have a maximum flame spread index/smoke developed index of 25/50 when tested in accordance with ASTM E84 or UL 723.

C. Furnish compatible materials which do not contribute to corrosion, soften, or otherwise attack surfaces to which applied, in either the wet or dry state.

D. Comply with ASTM C795 requirements for materials to be used on stainless steel surfaces.

E. Supply materials that are asbestos free.

2.2 GLASS FIBER (TYPE A)

A. Molded glass fiber insulation, ASTM C547, white kraft paper with glass fiber yarn vapor barrier jacket, bonded to aluminized film.

1. Maximum K-Value at 75°F: 0.24
2. Service Temperature Range: 0°F to 850°F
3. Maximum Water Vapor Absorption: 5.0% by weight
4. Maximum Water Vapor Permeance: 0.02 perm-in.

B. Seal joints with pressure sensitive adhesive tape compatible with the insulation. Provide vapor barrier mastic where recommended by manufacturer.

2.3 ELASTOMERIC CELLULAR FOAM (TYPE B)

A. Preformed flexible elastomeric cellular insulation, ASTM C534. Use molded tubular material wherever possible.

1. Maximum K-Value at 75°F: 0.25
2. Service Temperature Range: -70°F to 220°F
3. Maximum Water Vapor Absorption: 0.2% by volume
4. Maximum Water Vapor Permeance: 0.08 perm-in.

B. Seal joints with air dried, contact adhesive, compatible with insulation.

2.4 JACKETING

A. PVC jacket, white smooth gloss finish, self-sealing lap tape.

1. Maximum Service Temperature: 150°F
2. Minimum Thickness: 10 mil
3. Fittings: One-piece molded type fitting covers.
4. Provide sealing adhesive or mastic where recommended by manufacturer.

PART 3 EXECUTION

3.1 GENERAL

A. See pipe insulation schedule on the contract drawings for additional information.

B. Test piping for design pressure, liquid tightness, and continuity prior to applying insulation materials.

C. Verify that surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions, NAIMA National Insulation Standards, applicable codes, and industry standards.

B. Insulation, vapor barriers, and jacketing shall be installed continuous throughout the entire system including fittings, joints, flanges, valves, flexible connections, accessories, wall/floor penetrations, hangers/supports, etc. except as noted below.

1. Insulation on piping systems conveying water above 60°F may be allowed to break at penetrations of structural framing members.
2. Do not insulate flanges and unions at equipment in piping systems conveying water between 105°F and 140°F. Bevel and seal ends of insulation.

C. Installation shall maintain access to items that require maintenance/access such as valve handles, balance valve adjustment dial, and strainer discharges.

D. Exposed piping shall have insulation seams located in least visible locations.

E. Jacketing:

1. Provide PVC jacketing where specified on the contract drawings and in the following instances:
   a. On Type A insulation fittings.
   b. On exposed insulated pipes less than 10’ above finished floor.
   c. On exposed insulated pipes in high humidity spaces such as locker rooms and kitchens.
   d. On insulated pipes susceptible to damage from normal operations such as piping located in an attic that must be stepped over to perform maintenance activities.

2. Secure and seal fitting PVC jacketing with adhesive tape and vapor barrier mastic.

END OF SECTION 220719

SECTION 221005 - PLUMBING PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Sanitary waste and sanitary vent piping.

B. Domestic water piping.

C. Pipe flanges, unions, and couplings.

1.2 SUBMITTALS

A. See Section 22 0500 – Plumbing General Requirements for submittal procedures.

B. Submit data for manufactured pipes, fittings, and joint assemblies. Indicate size, material type, and compliance listing for each system described in Part 2 - Products.

C. Submit certification of welders' compliance with ASME BPVC-IX.

D. Submit manufacturer's installation instructions within closeout documentation.

E. Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer within closeout documentation.

F. Submit Sustainable Design Documentation for soldered copper joints, submit installer's certification that the specified installation method and materials were used.

G. Submit Sustainable Design Documentation for products meeting regulatory lead-content restrictions.

1.3 QUALITY ASSURANCE

A. Comply with ASME BPVC-IX welding materials, procedures, and applicable state labor regulations.

B. Manufacturer shall be a company specializing in manufacturing products of the type specified in this section with a minimum of three years of documented experience.

C. Installer shall be a company specializing in performing the type of work specified in this section, with a minimum of five years of experience and approved by the manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

B. Ensure materials are inspected for defects. Defective materials shall be returned immediately and replaced with new.

C. Ensure materials are properly stored to protect from mechanical damage and UV damage.

D. Protect piping systems from entry of foreign materials with temporary covers provide as sections of work are being completed.

1.5 FIELD CONDITIONS

A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.1 GENERAL

A. Materials shall have manufacturer applied identification, indicating compliance with the listings required in Part 2 – Products.

B. Potable water system piping, pipe fittings, solder, and flux (if used), shall be lead free in compliance with NSF 61, and NSF 372.

C. Piping provided within return air plenums shall meet a maximum flame spread index/ smoke developed index of 25/50 when tested in accordance with ASTM E84 or UL 723 unless otherwise noted.

D. Transition fittings at gravity drained cast iron and stainless steel pipe systems shall be ASTM 564, ASTM C1540, heavy duty shielded couplings.

E. Acceptable Pipe Manufacturers:

1. Cast Iron: Tyler, Charlotte, AB& I
2. Copper: Cero, Muller Steamline, Cambridge-Lee

2.2 SANITARY WASTE AND SANITARY VENT PIPING, DIRECT-BURIED WITHIN 5 FEET OF BUILDING

A. Cast Iron Pipe: ASTM A74, extra heavy weight.

1. Fittings: Cast iron.
2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gasket or caulked joint with lead and oakum.
3. Pipe encasement: Where soil is found to be corrosive provide ASTM D1248 polyethylene encasement in tube or sheet form, low-density film shall be 0.008” thick, high-density film shall be 0.004” thick. Apply to pipes and fittings. Any damaged sections shall be repaired with 20 mil tape before burial.

B. Cast Iron Pipe: CISPI 301, hubless.

1. Fittings: Cast iron.
2. Joints: CISPI 310, ASTM 1540, heavy duty coupling with stainless-steel clamps, 300 series shield, and ASTM C564 neoprene gasket.
3. Pipe encasement: Where soil is found to be corrosive provide ASTM D1248 polyethylene encasement in tube or sheet form, low-density film shall be 0.008" thick, high-density film shall be 0.004" thick. Apply to pipes and fittings. Any damaged sections shall be repaired with 20 mil tape before burial.

2.3 SANITARY WASTE AND SANITARY VENT PIPING ABOVE GRADE

A. Cast Iron Pipe: ASTM A74, service weight.

1. Fittings: Cast iron.
2. Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gasket or caulked joint with lead and oakum.

B. Cast Iron Pipe: CISPI 301, hubless, service weight.

1. Fittings: Cast iron.
2. Joints: CISPI 310, ASTM C564 neoprene gasket, stainless-steel clamps, and 300 series shield assembly.
3. Joints: CISPI 310, ASTM 1540, heavy duty coupling with stainless-steel clamps, 300 series shield, and ASTM C564 neoprene gasket.

2.4 DOMESTIC WATER PIPING, ABOVE GRADE

A. Copper Tube: ASTM B88, Type L, hard drawn.

1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
2. Joints: ASTM B32, alloy Sn95 solder.
3. Joints: Grooved mechanical couplings.
4. Mechanical Press Sealed Fittings: Double-pressed type, NSF 61 and NSF 372 approved or certified, utilizing EPDM, nontoxic, synthetic rubber sealing elements.

2.5 PIPE FLANGES, UNIONS, AND COUPLINGS

A. Unions for Pipe Sizes 3" and Under:

1. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.

B. Flanges for Pipe Sizes Over 1":

1. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.

C. Dielectric unions shall be galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

PART 3 EXECUTION

3.1 INSTALLATION

A. General:

1. Install piping systems in accordance with manufacturer's instructions and applicable codes.
2. Provide non-conducting dielectric connections wherever joining dissimilar metals.
3. Pipe system slope shall be uniform unless noted otherwise, and free of drops or sags.
4. Provide full length pipes, smaller sections can be utilized when distances between fittings, equipment, or fixtures don’t allow.
5. Provide sleeves for pipes passing through partitions, walls, floors, and foundations.
6. Prepare exposed, unfinished pipe, fittings, supports, and accessories for finish painting.

B. Direct-buried Piping:

1. Verify excavations are to required grade, dry, and not over-excavated.
2. Establish elevations of plumbing utilities as indicated on the drawings.
3. Establish a minimum 1 foot horizontal separation between buried utilities.
4. Field verify electrical and civil utility locations prior to excavation and installation of plumbing utilities.
5. See contract drawings for additional notes pertaining to saw cutting, excavation, backfill, and surface restoration.

C. Above Grade Piping:

1. Route piping in an orderly manner and maintain gradient. Route parallel and perpendicular to walls avoiding unnecessary offsets.
2. Group piping whenever practical at common elevations.
3. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
4. Piping shall be arranged to service or remove equipment without altering piping upstream of the isolation valves serving said equipment.
5. Provide eccentric reduced fittings on horizontal piping arranged so the bottom of the pipe is continuous for proper drainage.

6. Where pipe sizes are shown to be reduced after a branch connection, the reducer fitting shall be provided downstream of the branch tee. The branch tee shall be sized to match the largest pipe size connected.
7. Where equipment connections are smaller than designed line sizes, the reducer shall be placed downstream of valves, unions, flexible connections, and similar pipe accessories serving that piece of equipment.
8. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc-rich primer to welding.
9. Refer to architectural drawings for roof flashing methods, flashing shall meet the roof manufacturers installation requirements.
10. Provide support for utility meters in accordance with requirements of utility companies.
11. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

D. Sanitary Drainage and Sanitary Vent Systems:

1. Buried cast iron piping systems shall be provided with factory applied protective coating or .008 polyethylene wrap per ASTM A74 installation standards, when installed in corrosive soils.
2. Slope horizontal sanitary drainage piping at 1/4” per foot unless otherwise noted on plumbing drawings.
3. Slope horizontal storm piping as noted on plumbing drawings.
4. Slope sanitary vent systems at 1/16” per foot arranged to drain back to the sanitary drainage system.
5. No-Hub cast iron pipe systems shall be restrained per CISPI designation 3011 and per the manufacturer’s instruction.
6. Install bell and spigot pipe with bell end upstream.
7. Double-wye or double combination 1/8 bend fittings are not permitted in horizontal piping.

E. Domestic/Industrial Water System:

1. Install per ASME B31.9 standards.
2. Extend water branch lines at 45° or 90° angles from the top of the main.
3. Slope horizontal water piping at 1” per 40’, arranged to drain at low points with drain valves.

3.2 JOINING METHODS

A. Joining methods described below are supplemental, see manufacturer’s detailed installation instructions for additional requirements.

B. Mechanical Compression Joint (No Hub): Pipe ends shall be square and smooth. Clean adjoining surfaces in preparation for ASTM C-564 neoprene gasket sleeve and shielded coupling. Insert pipe ends into each side of gasket until the ends butt against the gasket shoulder. Center the coupling shield over the gasket and hand tighten the screws, complete tightening process with a torque wrench per the manufacturer's instructions.

C. Solder Joint (Copper Pipe): ASTM B32 lead free solder, pipe ends shall be cut to ensure clean square edges and burrs removed inside and outside. Remove oxide, dirt, and grease from fitting sockets prior to soldering. Non-acid type Flux shall be provided neat and even over heated surfaces to be joined. Heat joint evenly, wipe excess solder to leave an even fillet all around.

D. Flanged Joints: ANSI B16.5 steel raised face flanges, and ANSI B16.1 cast iron flanges shall be sealed with the manufacturer's recommended gasket for service type. Secure flanges with ANSI B18.2.1/B18.2.2 square head bolts and heavy hex nuts. Nuts shall be tightened in a perpendicular fashion rotating around the flange.

3.3 APPLICATION

A. Install unions downstream of valves and at equipment or apparatus connections.

B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

3.4 FLUSHING

A. Flush constructed pipe systems with valves wide open, strainers installed, and equipment disconnected, including accessories that could be damaged during the process. Upon completion of flushing remove and clean connected filters, strainers, or aerators.

3.5 FIELD TESTS AND INSPECTIONS

A. Test and inspect piping systems in accordance with manufacturer's instructions and applicable codes.

B. Pressure test shall be performed on all portions of new systems and modified sections of existing systems. Where isolated sections of new piping systems are required to be tested separately, the contractor shall provide additional isolation valves and test ports as required at no additional charge to the owner.

C. Testing shall occur in front of the Owner's representative and Authority Having Jurisdiction.

D. Gravity Drainage and Vent Piping:

1. Perform hydrostatic test.
2. Preparation: Pipe openings shall be tightly closed with exception to the highest opening in the system, or highest opening within the section being tested.

3. Preparation: Pipe openings shall be tightly closed after the compressor test apparatus is attached.
4. Testing:
    a. Hydrostatic sectional test: Each test section shall be filled with water, maintain a minimum 10-foot head of water for not less than 15 minutes before the inspection starts. There shall be no evidence of leaking.

E. Domestic Water Piping:

1. Perform hydrostatic test prior to system disinfection.
2. Close each fixture valve or disconnect and cap each connected fixture prior to testing.
3. Testing:
    a. Hydrostatic test: Fill the system with water, pressurize the system to greater than or equal to the service pressure not to exceed 80 PSI. The system shall maintain test pressure and show no evidence of leaking for not less than 15 minutes.

F. Test Results: Document and certify successful results, otherwise repair, document, and retest.

3.6 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. The disinfection process including the engineer's approval of third-party lab test results shall be completed prior to utilization of the newly constructed or altered sections of the potable water system.

B. Prior to starting work, flush the system with clean, potable water until potable water appears at the points of each outlet.

C. The system or parts thereof shall be filled with a water-chlorine solution containing not less than 50 parts per million of chlorine. The system or part thereof shall be valved-off and allowed to stand for 24 hours.

D. The system or parts thereof shall be filled with a water-chlorine solution containing not less 200 parts per million of chlorine. The system or part thereof shall be valved-off and allowed to stand for 3 hours.

E. Following the required standing time, the system shall be flushed with clean, potable water incoming flushing water.

F. Water samples shall be taken from 5% of outlets and the water supply 24 hours after the system has been flushed. Samples shall be analyzed in accordance with AWWA C651, section 5 – verification.

G. Lab results shall be provided to the engineer indicating the absence of E.coli and Coliforms, and include a total Heterotrophic Plate Count (HPC).

H. The disinfection procedure shall be repeated where E.coli or Coliforms are present, or where Heterotrophic Plate Counts exceed acceptable limits as determined by the engineer of record.

3.7 CLEANING

A. Remove scale and dirt from pipe systems after assembly and testing. Cleaning methods shall be consistent with industry standards.

END OF SECTION 221005

SECTION 223000 - PLUMBING EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Plumbing equipment requirements.

1.2 SUBMITTALS

A. See Section 22 0500 – Plumbing General Requirements for submittal procedures.

B. Submit shop drawings indicating dimensions of equipment assemblies, include individual dimensions of equipment, tanks, pumps, and the piping system components.

C. Submit manufacturer's installation instructions. Indicate procedures necessary to ensure acceptable workmanship and that installation standards will be achieved.

D. Submit operation and maintenance data including inspection data, replacement part numbers and availability, and service depot location and telephone number.

1.3 QUALITY ASSURANCE

A. Products requiring electrical connection shall be Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

B. Manufacturer shall be a company specializing in manufacturing the products specified in this section with a minimum of three years of documented experience.

C. Installer shall be a company specializing in performing the type of work specified in this section with a minimum five years of experience and approved by the manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Accept equipment on site in factory packaging. Inspect equipment to ensure they were not damaged during shipping. Damaged equipment shall be replaced with new.

B. Store equipment to protect from weather, dust and other hazardous elements.

C. Protect installed equipment from damage by securing areas and by leaving factory packaging in place until equipment start up.

PART 2 PRODUCTS

2.1 GENERAL

A. See Plumbing Material List within the contract documents for acceptable manufacturers and equipment requirements.

2.2 ELECTRICAL WORK

A. Electrical characteristics to be as specified or indicated.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install plumbing equipment in accordance with manufacturer's instructions, as required by code, and complying with conditions of certification, if any.

B. Equipment shall be provided level and secured per the contract documents.

END OF SECTION 223000

SECTION 224000 - PLUMBING FIXTURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Plumbing fixture Requirements.

1.2 SUBMITTALS

A. See Section 22 0500 – Plumbing General Requirements for submittal procedures.

B. Product data shall include catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

C. Manufacturer's instructions shall indicate installation methods and procedures.

D. Maintenance data shall Include fixture trim exploded view and replacement parts lists.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Flush Valve Service Kits: One for each type and size.

1.3 QUALITY ASSURANCE

A. Manufacturer shall be a company specializing in manufacturing the products specified in this section with a minimum of three years of documented experience.

B. Installer shall be a company specializing in performing the type of work specified in this section with a minimum five years of experience and approved by the manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Accept fixtures on site in factory packaging. Inspect fixtures to ensure they were not damaged during shipping. Damage fixtures shall be replaced with new.

B. Store fixtures to protect from weather, dust, and other hazardous elements.

C. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

PART 2 PRODUCTS

2.1 GENERAL

A. See Plumbing Material List within the contract documents for acceptable manufacturers and fixture requirements.

PART 3 EXECUTION

3.1 GENERAL

A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

B. Verify that electric power is available and of the correct characteristics.

C. Rough-in fixture piping connections in accordance with minimum sizes indicated in the contract documents.

3.2 INSTALLATION

A. Install each fixture with trap, easily removable for servicing and cleaning.

B. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.

C. Install components level and plumb.

D. Install and secure fixtures in place with wall supports and bolts.

E. Solidly attach water closets to floor with lag screws. Lead flashing is not intended hold fixture in place.

3.3 INTERFACE WITH WORK OF OTHER SECTIONS

A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.4 ADJUSTING

A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.5 CLEANING

A. Clean plumbing fixtures prior to turnover to Owner.

END OF SECTION 224000

SECTION 230500 - MECHANICAL GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General requirements applicable to all Division 23 Sections.

1.2 DEFINITIONS

A. A/E: Project Architect and/or Engineer.

B. Furnish: To purchase/supply.

C. Install: To place in position and connect complete ready for use.

D. Provide: To furnish and install.

1.3 GENERAL

A. The contract drawings are a diagrammatic representation of the design intent. They do not show every component required for a complete and operational system. The Contractor shall install complete and operational systems based on the design intent.

B. The installation shall comply with the contract documents, applicable codes, manufacturer's installation recommendations, published Owner standards, utility company requirements, and requirements of the AHJ.

1. Notify the A/E in writing of any discrepancies in the contract documents and any of the authorities listed above prior to submitting a bid.
2. If there is a discrepancy between manufacturer's installation recommendations and the contract documents, the manufacturer's recommendations shall take precedence.
3. If there are conflicting requirements in the contract documents, the more restrictive requirement shall govern.

C. Contractor shall apply, procure, and pay for required permits, licenses, inspections, and any other fees.

1.4 EXAMINATION OF CONTRACT DOCUMENTS

A. The drawings show the design intent diagrammatically. They do not show the exact routing nor every elbow, offset, etc. Do not scale the drawings. The Contractor shall determine the exact installed locations and routing to achieve the design intent. The cost of reasonable adjustments to locations and routing shall be included in the bid. The Contractor shall visit the project site prior to submitting a bid to confirm existing conditions and new work plan of action.

B. Where discrepancies in quantities or sizes exist in the contract documents the greater number shall govern.

C. Verify all dimensions at the jobsite prior to ordering any materials.

1.5 SUBMITTALS

A. Submittals shall be required if requested in applicable specification section or drawings. Submittals will not be reviewed by engineer for specific products if they are not requested in the contract documents.

B. Contractor shall provide separate submittal packages for each specification section. Submittals including multiple specification sections are not acceptable. All items within an individual specification section shall be provided within a single submittal. Providing multiple submittals for a single specification section is not acceptable unless the project has multiple phases.

C. Submittals shall be in PDF format. File name shall include the specification number and description of the submitted item.

D. Content Requirements:

1. Each submittal shall include a cover sheet containing date, project name and number, contractor's name and address, specification number, items submitted, deviations from contract documents, and a blank space for review stamps.
2. Submitted items that have a scheduled equipment tag number on the contract documents shall bear such tag number in the submittal to clearly identify submitted item.
3. Selected options such as model, material, finish, etc. shall be clearly identified.
4. Contractor shall provide review stamp on each submittal, including name of reviewer and date, indicating the content in the submittal has been thoroughly reviewed for completeness and accuracy prior to submitting.
5. Clearly identify deviations, if any, from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.

E. Submittals shall be approved by the A/E prior to ordering items. Approval of submittals does not relieve the contractor's obligation to comply with the contract documents.

F. The A/E reserves the right to invoice the Contractor for time spent for multiple reviews of submittals that are the result of incomplete, inaccurate, or noncompliant submittals being rejected.

1.6 MATERIAL SUBSTITUTION

A. The Contractor may submit a request for a material substitution for any item made by a manufacturer not listed as an approved manufacturer in the applicable specification. The

request shall include enough information for the A/E to determine if the substituted item is of equal or better performance and quality than that listed in the contract documents.

B. Material substitution requests shall be submitted no later than the last day for pre-bid RFIs.

C. If a material substitution request is not submitted on time, the Contractor may include the substitution as a voluntary substitution on the bid form. Such substitutions will not be considered in determining the low bidder.

D. The Contractor that submitted the material substitution is responsible for any additional costs incurred by other Contractors as a result of the alternate product.

1.7 VALUE ENGINEERING

A. If material or design changes are proposed during construction in an effort to save costs and the Owner agrees to the changes, the Contractor shall pay the design team on a time and material basis to address engineering modifications required.

1.8 WARRANTY

A. Provide a minimum of one-year parts and labor warranty for all fixtures, equipment, components, materials, and workmanship. Longer warranties may be required for certain systems as noted in other specification sections.

B. The warranty period shall start on the date of final acceptance by the Owner. If a newly installed system or piece of equipment is needed to operate the building during construction, the Contractor may agree to a warranty period start date with the Owner that begins prior to the final acceptance of the overall project. The Contractor shall obtain such an agreement in writing from the Owner's Representative.

C. The Contractor shall adjust the systems at seasonal changes, as needed, during the one-year warranty period to prove satisfactory operation during all seasons.

1.9 CHANGE ORDERS

A. Submit a detailed material and labor takeoff for each change order. Identify cost additions and credits based on revised scope. Material costs and required labor hours shall closely align with reputable cost estimating publications. Change orders lacking sufficient breakdown of costs and supporting documentation will be rejected.

B. Do not proceed with change order work until authorized.

PART 2 PRODUCTS

2.1 NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

A. The Contractor is solely responsible for jobsite safety.

B. Work shall be completed by individuals qualified and competent in that specific task.

C. Work that will produce excessive noise shall be completed during unoccupied hours. Coordinate schedule of noisy operations with the Owner's Representative.

D. Install equipment, devices, and components with sufficient clearance to easily maintain parts. Review the final location of equipment with the Owner's Representative prior to setting equipment.

E. Provide factory or field-supplied guard to protect personnel from coming into contact with rotating equipment components.

F. Provide temporary power as needed to support construction activities. Remove temporary power when no longer needed.

G. Thoroughly clean entire project site prior to final turnover to the Owner.

3.2 PRODUCT HANDLING AND STORAGE

A. The Contractor shall review the required path of travel to navigate equipment, devices, materials, etc. to and from the project area prior to submitting a bid. Overcoming any obstacles shall be accounted for in the bid.

B. Carefully transport and store equipment, devices, materials, etc. to prevent damage. The Contractor shall replace damaged items at no additional cost.

C. Paint equipment and devices that are scratched prior to Owner's acceptance. Paint type and color shall match original.

3.3 OCCUPIED BUILDING UNDER CONSTRUCTION IAQ

A. Coordinate IAQ plan with Owner's Representative throughout construction.

B. The Contractor shall take steps necessary, including those in SMACNA IAQ Guidelines for Occupied Buildings Under Construction, to minimize construction dust/contaminants in order to limit the impact to the air quality of the adjacent occupied areas.

C. Construction activities that produce excessive dust shall be completed during unoccupied hours.

D. The construction site entrance shall not go through the existing building, if possible.

E. Adhesives and sealants shall be tested and compliant with applicable low emitting materials limits.

3.4 A/E JOBSITE OBSERVATIONS

A. The Contractor shall provide one full week notice to the A/E prior to making utility installation inaccessible to allow for visual observation of installed work by A/E. Such actions include backfilling over underground utilities or closing walls or ceilings containing utilities.

B. By notifying the A/E that the underground, above ceiling, or in wall work is ready for observation, the Contractor is certifying that such work is complete and does not require additional work. This includes, but is not limited to, hangers, supports, insulation, identification, and sealed penetrations. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.

C. IMPORTANT: Astral Engineers must observe the installation of their portion of the design. If observation of such installation is prevented due to the work being covered by backfill, walls, ceilings, etc. prior to observation by Astral Engineers, the Contractor will be required to expose the work so it can be adequately observed.

D. By notifying the A/E that the construction is complete and ready for the final jobsite observation, the Contractor is certifying that such work is complete and does not require additional work. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.

E. Astral Engineers will issue a jobsite observation report after each site visit noting any installation deficiencies, if any. The Contractor shall fix all deficiencies to the satisfaction of the A/E. Provide photographic and/or video evidence of corrected deficiencies signed off if requested by the A/E. The construction schedule shall account for these site visits and required corrections. Schedule extensions will not be allowed to accommodate A/E jobsite observations.

3.5 SYSTEM STARTUP AND TURNOVER

A. The Contractor shall perform complete system startup, calibration, testing, adjusting, and balancing. See manufacturer startup procedures.

B. All operating conditions, control sequences, interlocks, and alarms shall be tested during the startup process.

C. Contractor shall provide verbal and written training for the Owner's representatives regarding the complete maintenance and operation requirements for all systems. Manufacturer personnel shall provide such instruction for major equipment and systems.

3.6 PROJECT CLOSEOUT

A. Operation and Maintenance Manuals:

1. Email a bookmarked electronic copy of the O&M manuals in PDF format to the A/E. All text shall be searchable.
2. Provide the Owner a copy of the O&M manuals on disc or flash drive. Disc or flash drive shall be labeled with project name and “O&M Manual”.
3. Content Requirements:
    a. Provide title page with the project name, Architect, Engineers, Contractors, and major equipment suppliers. Include a point of contact for each entity with telephone numbers and email addresses.
    b. Provide table of contents with hyperlinks to content within document.
    c. Provide parts lists, wiring diagrams, control diagrams, operating procedures, and maintenance schedule and procedures for all systems.
    d. Provide all approved submittals, testing reports, equipment startup reports, factory inspection reports, and warranties.
    e. Group submittals and other supplemental information with the associated O&M manual to maintain a neat and organized document.

B. Record Documents:

1. The Contractor shall clearly markup drawings to indicate equipment, device, component, and/or utility actual installed location and size. Provide such marked up as-built drawings to A/E at the completion of construction.
2. The Contractor shall clearly markup specifications to indicate any changes to contract specifications based on actual installed conditions. Provide such marked up specifications to A/E at the completion of construction.

END OF SECTION 230500

SECTION 230505 - MECHANICAL DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selective demolition.

B. Patching.

1.2 QUALITY ASSURANCE

A. Demolition firm shall be a company specializing in the type of work required with a minimum of five years of documented experience.

PART 2 PRODUCTS

2.1 NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

A. The drawings are diagrammatic and do not show every duct, pipe, fitting, accessory, etc. required to be removed. The Contractor shall visit the site prior to bid submission to verify all field conditions.

B. Comply with other requirements specified in Divisions 01 and 02.

C. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Comply with applicable requirements of NFPA 241.
2. Use of explosives is not permitted.
3. Provide, erect, and maintain temporary barriers and security devices.
4. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
6. Do not close or obstruct roadways or sidewalks without a permit.
7. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

D. Do not begin removal until built elements to be salvaged or relocated have been removed, vegetation to be relocated has been removed, measures have been taken to protect existing conditions to remain, and the Contractor has received notification to proceed from the Owner.

E. Protect existing structures and other elements that are not to be removed.

1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

F. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. Install temporary filters over outside air intakes within 100' of the construction area. If construction activities result in debris affecting existing to remain systems, the Contractor shall completely clean such systems.

H. If hazardous materials are discovered during removal operations, stop work and notify A/E and Owner's Representative. Hazardous materials include regulated asbestos containing materials, lead, polychlorinated biphenyls, and mercury.

I. Removal of hazardous materials shall comply with 29 CFR 1926 and state and local regulations.

J. Perform demolition in a manner that maximizes salvage and recycling of materials.

1. Dismantle existing construction and separate materials.
2. Set aside reusable, recyclable, and salvageable materials. Store and deliver to collection point or point of reuse.

3.2 EXISTING UTILITIES

A. Protect existing utilities to prevent damage.

B. Do not close, shut off, or disrupt existing systems that are in use without at least two weeks prior written notification to Owner's Representative.

C. Remove ductwork, piping, valves, meters, equipment, hangers, supports, and foundations of disconnected and abandoned utilities.

D. Patch holes resulting from the removal of existing utilities to match existing construction. Provide firestopping as required in fire-rated walls.

3.3 SELECTIVE DEMOLITION

A. Drawings showing existing construction and utilities are based on nondestructive field observation and existing record documents only.

1. Verify that construction and utility arrangements are as indicated.
2. Report discrepancies to A/E before disturbing existing installation.
3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied. Provide, erect, and maintain temporary dustproof, sound retardant partitions separating the construction area and adjacent occupied spaces.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications. Take care to prevent water and humidity damage.

D. Remove existing systems and equipment as indicated and as required to accomplish new work.

1. Existing systems that serve areas outside of the construction area shall remain active. Maintain access to equipment and operational components. Where existing systems must be shut off to allow for new connections, provide at least two weeks prior written notification to the Owner's Representative.
2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
3. Verify that abandoned services serve only abandoned facilities before removal.
4. Remove abandoned equipment, ducts, pipes, conduits, controls, and associated hangers, supports, accessories, etc. including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.

1. Perform cutting to accomplish removals neatly and as specified for cutting new work.
2. Repair adjacent construction and finishes damaged during removal work.
3. Patch as specified for patching new work.

3.4 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove all materials not to be reused from site.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 230505

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SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Testing, adjusting, and balancing of air systems.

1.2 SUBMITTALS

A. See Section 23 0500 – Mechanical General Requirements for submittal procedures.

B. Submit name and qualifications of adjusting and balancing agency and TAB supervisor for approval within 30 days after award of Contract. State testing, adjusting, and balancing standard to be followed.

C. Submit TAB report indicating design values, final balanced values, and deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance within two weeks after completion of testing adjusting and balancing.

1.3 QUALITY ASSURANCE

A. TAB agency shall be certified by Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB), or The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute (TABB).

B. TAB supervisor and technicians shall be certified by same organization as TAB agency.

C. Provide guarantee of work performed in accordance with AABC National Performance Guaranty, NEBB Conformance Certification or TABB Quality Assurance Program.

D. TAB agency shall be a company specializing in the testing, adjusting, and balancing of systems specified in this section with a minimum of three years of documented experience.

PART 2 PRODUCTS

2.1 NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

A. Perform total system balance in accordance with AABC (NSTSB), AABC National Standards for Total System Balance or SMACNA (TAB). Maintain at least one copy of the standard to be used at project site at all times.

B. Communicate in writing to the controls installer all setpoint and parameter changes made or problems and discrepancies identified during TAB that affect, or could affect, the control system setup and operation.

C. Equipment shall be calibrated within the last six months.

3.2 EXAMINATION

A. Verify that systems are complete and operable before commencing work including, but not limited to, the following conditions:

1. General
    a. Systems are started and operating in a safe and normal condition.
    b. Temperature control systems are installed complete and operable.
    c. Proper thermal overload protection is in place for electrical equipment.
    d. Air coil fins are cleaned and combed.
2. Duct Systems:
    a. Final filters are clean and in place. If required, install temporary media in addition to final filters.
    b. Duct systems are clean of debris.
    c. Fans are rotating correctly.
    d. Life safety and volume dampers are in place and open.
    e. Access doors are closed and duct end caps are in place.
    f. Air outlets are installed and connected.
    g. Duct system leakage is minimized.

B. Report defects, deficiencies, and issues that will or could prevent proper system balance to the A/E.

C. Beginning of work means acceptance of existing conditions.

3.3 PREPARATION

A. Hold a pre-balancing meeting at least one week prior to starting TAB work. Require attendance by all installers whose work will be tested, adjusted, or balanced.

B. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to A/E to facilitate spot checks during testing.

3.4 ADJUSTMENT TOLERANCES

A. Individual air outlets and inlets: ±10% of design

B. Total airflow to or from an individual space: ±5% of design

C. Individual system supply air: ±5% of design

D. Individual system return, exhaust, or relief air: ±10% of design

3.5 RECORDING AND ADJUSTING

A. Ensure recorded data represents actual measured or observed conditions.

B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

C. Mark on drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.

D. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.

E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

F. At final inspection, the Owner may require random selections of data recorded in report to be rechecked. Recheck points or areas as selected and witnessed by the Owner. Up to 10% of measurements may be rechecked. If 20% or more of the rechecked data points are not within specified tolerances, all test and balance work shall be redone at no additional cost.

3.6 AIR SYSTEM REQUIREMENTS

A. Adjust air handling and distribution systems to provide required or design supply, return, exhaust, relief, and outside air quantities.

B. Make air quantity measurements in ducts by pitot tube traverse of entire cross-sectional area of duct.

C. Adjust air quantities at air inlets and outlets.

D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.

E. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.

F. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for at least 50% loading of filters.

G. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.

H. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05” w.c. positive static pressure near the building entries.

3.7 TAB REPORT

A. The information provided within this section is the minimum that shall be included in the TAB report.

B. Provide bookmarked PDF TAB report with a table of contents and searchable text.

C. Provide a title page with general project information including the following:

1. Report date.
2. Name, address, and telephone number of TAB Agency.
3. Project name and address.
4. Project number.
5. Architectural firm.
6. Mechanical engineering firm.
7. Mechanical contractor.

D. Include actual instrument list, with manufacturer name, serial number, and date of calibration.

E. Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.

F. Units of measure shall be I-P (inch-pound).

G. Include floor plan drawings with air outlets/inlets, equipment, and balancing components identified to correspond with data sheets and indicating thermostat locations.

H. Provide a unique identifying tag number (match scheduled tag number when applicable) and location of item for all items included in the TAB report.

I. Electric Motors:

1. Manufacturer, model, and frame
2. HP/BHP.
3. Phase, voltage, amperage; nameplate, actual, no load.
4. Service factor.
5. Starter size, rating, heater elements.
6. Sheave make/size/bore.

J. Air Moving Equipment:

1. Manufacturer, model number, and serial number
2. Arrangement/Class/Discharge.

3. Supply airflow, specified and actual.
4. Return airflow, specified and actual.
5. Outside airflow, specified and actual.
6. Relief airflow, specified and actual
7. Filter pressure drop, specified and actual
8. Total external static pressure, specified and actual.
9. Inlet pressure.
10. Discharge pressure.
11. Sheave make/size/bore.
12. Fan RPM.
13. VFD frequency.

K. Exhaust Fans:

1. Manufacturer, model number, and serial number
2. Airflow, specified and actual.
3. Total static pressure, specified and actual.
4. Inlet pressure.
5. Discharge pressure.
6. Sheave make/size/bore.
7. Fan RPM.

L. Air Outlets & Inlets:

1. Room name and number.
2. Duct connection size.
3. Velocity.
4. Airflow, specified and actual.
5. Actual percentage of specified airflow.

M. Duct Traverses:

1. System zone/branch.
2. Duct size.
3. Velocity, specified and actual.
4. Airflow, specified and actual.
5. Duct static pressure.
6. Air temperature.
7. Air correction factor.

END OF SECTION 230593

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SECTION 230713 - DUCT INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Duct wrap insulation.

1.2 QUALITY ASSURANCE

A. Manufacturer shall be a company specializing in manufacturing products of the type specified in this section with a minimum of three years of documented experience.

B. Installer shall be a company specializing in performing the type of work specified in this section with a minimum of five years of experience and approved by the manufacturer.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.4 FIELD CONDITIONS

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

B. Maintain temperature before, during, and after installation for minimum period of 24 hours.

PART 2 PRODUCTS

2.1 GENERAL

A. Wrap insulation types are applied external to the ductwork. Liner insulation types are applied internal to the ductwork.

B. Maximum flame spread index/smoke developed index of 25/50 when tested in accordance with ASTM E84 or UL 723, unless otherwise noted.

2.2 GLASS FIBER FLEXIBLE WRAP (TYPE A)

A. Acceptable Manufacturers:

1. CertainTeed Corporation
2. Johns Manville
3. Knauf Insulation
4. Owens Corning Corporation

B. ASTM C553; flexible, noncombustible blanket.

1. Maximum K-Value at 75°F: 0.29/0.27 (labeled thickness/25% compression)
2. Maximum Service Temperature: 250°F
3. Maximum Water Vapor Absorption: 5.0% by weight

C. Vapor Barrier Jacket:

1. Kraft paper with glass fiber yarn and bonded to aluminized film.
2. Maximum moisture vapor permeability of 0.02 perms when tested in accordance with ASTM E96.
3. Secure with UL 181 pressure sensitive tape. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber-based adhesive.

D. Tie Wire: Annealed steel, 16 gauge.

PART 3 EXECUTION

3.1 GENERAL

A. See ductwork insulation schedule on the contract drawings for additional information.

B. Test ductwork for design pressure prior to applying insulation materials.

C. Verify that surfaces are clean, foreign material removed, and dry prior to installation of insulation.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions, NAIMA National Insulation Standards, applicable codes, and industry standards.

B. Insulation shall be installed with full thickness throughout including at corners. Insulation shall be tight to ductwork but shall not be overly compressed or crushed.

C. Adhesive tapes shall be installed tight to achieve a continuous seal.

D. Insulation shall be installed continuous throughout entire system including fittings, joints, flanges, dampers, flexible connection, wall/floor penetrations, expansion joints, and hangers/supports.

E. Installation shall maintain access to items that require maintenance/access such as dampers and access doors.

F. Glass Fiber Flexible Wrap (Type A):

1. Secure insulation with tie wires and seal jacket joints with tape to match jacket.
2. Install without sag on underside of duct. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct off trapeze hangers and insert spacers.
3. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
4. Provide mechanical fasteners for large ductwork.
5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.
6. Glass fiber flexible wrap shall not be used where insulation is subject to damage such as ducts at a low elevation that can be stepped on or bumped. Use rigid board wrap instead.

G. Do not paint duct insulation.

END OF SECTION 230713

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SECTION 233100 - HVAC DUCTWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Duct materials and fabrication.

B. Leak testing.

C. Duct cleaning.

1.2 QUALITY ASSURANCE

A. Manufacturer shall be a company specializing in manufacturing the type of products specified in this section with a minimum of five years of documented experience.

B. Installer shall be a company specializing in performing the type of work specified in this section with a minimum of five years of documented experience.

1.3 FIELD CONDITIONS

A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.

B. Maintain temperatures within acceptable range during and after installation of duct sealants.

PART 2 PRODUCTS

2.1 GENERAL

A. Regulatory Requirements: Construct ductwork to comply with NFPA 90A or 90B, SMACNA, contract drawings, and contract specifications. Factory fabricated ductwork shall comply with UL 181. Pressure sensitive tapes, mastics, mastics, and sealants shall comply with UL 181, UL 181A, and UL 181B as applicable.

B. Duct Material Usage:

1. Galvanized Steel: For use in all aboveground ductwork applications unless otherwise indicated in the contract specifications or on the contract drawings.

2.2 DUCT MATERIALS

A. Galvanized Steel (Indoor): Hot-dipped galvanized steel sheet, ASTM A653 FS Type B, with G60/Z180 coating.

2.3 DUCTWORK FABRICATION

A. General

1. Duct sizes indicated are inside clear dimensions. For lined ducts, maintain sizes inside lining.
2. Fabricate and support metal ductwork and fittings in accordance with SMACNA HVAC Duct Construction Standards and as indicated in the contract documents.
3. Contractor may alter duct sizes from those shown on the contract drawings provided that the cross-sectional area does not decrease, and the air pressure drop does not increase. Duct aspect ratio shall not exceed 3:1.
4. Provide duct material, gauges, reinforcing, and sealing for the operating pressures indicated per SMACNA HVAC Duct Construction Standards, applicable codes, and the construction documents.
5. Seal metal ductwork in accordance with SMACNA Seal Class A.
6. All metal ductwork shall be beaded or cross-broken.
7. Button punch snap-lock seams are not permitted.
8. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where square throat elbows must be used, provide airfoil turning vanes of perforated metal with glass fiber insulation.
9. Provide turning vanes of perforated metal with glass fiber insulation when duct liner is indicated.
10. Increase duct sizes gradually, not exceeding 15° divergence wherever possible; maximum 30° divergence upstream of equipment and 45° convergence downstream.

B. Metal Single Wall Ducts

1. Round Duct: Round spiral lockseam duct. Fittings shall be furnished with continuous corrosion-resistant welds.
2. Rectangular Ducts: Rectangular spiral lockseam duct.

C. Minimum Static Pressure Class:

1. Duct system, including ductwork and fittings, shall be constructed with a minimum static pressure class matches the existing duct system unless otherwise indicated on the contract drawings. All duct systems shall be constructed to a pressure class that will withstand the highest pressures they will encounter during operation.

2.4 METAL AND FLEXIBLE DUCT SEALANTS

A. Joint Sealers and Sealants: Non-hardening, non-toxic, water resistant, mildew and mold resistant.

1. Type: UL Listed, heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.
2. VOC Content: Not more than 250 g/L, excluding water.
3. Surface Burning Characteristics: Maximum flame spread index/smoke developed index of 0/0 when tested in accordance with ASTM E84.
4. Service Temperature Range: -20°F to 200°F
5. Rated for indoor or outdoor use as applicable.

B. Gasket Tape: Provide butyl rubber gasket tape for a flexible seal between transfer duct connector (TDC), transverse duct flange (TDF), applied flange connections, and angle rings connections.

PART 3 EXECUTION

3.1 GENERAL

A. Ship, store, and handle ductwork carefully to prevent damage. Inspect each length prior to installation.

3.2 INSTALLATION

A. Install, support, and seal ducts in accordance with the contract documents and SMACNA HVAC Duct Construction Standards.

B. Install in accordance with manufacturer's instructions.

C. Coordinate exact routing with other trades to minimize number of fittings.

D. During construction provide temporary closures on open ends of ductwork to prevent construction dust from entering ductwork.

E. Final duct runouts to air inlets and outlets shall match air inlet or outlet neck size unless specifically labeled as a larger size on the contract drawings.

F. Branch connections shall be a least four duct diameters downstream of an elbow when the branch is on the inside edge of the elbow.

G. Square throat elbows shall not be used where radius elbows are shown on the contract drawings.

H. Install ducts with sufficient space around equipment and components to allow normal operating and maintenance activities.

I. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

3.3 SUPPORTS AND HANGERS

A. Support in accordance with details shown on the contract drawings.

B. Hanger straps shall be galvanized steel. Hanger rods shall be uncoated hot-rolled steel except in corrosive atmospheres. In corrosive atmospheres, hanger rods shall be hot-dipped galvanized with painted threads after installation.

C. Horizontal ducts shall have a support within 2' of each elbow and within 4' of each branch intersection.

D. Hangers and supports shall not deform duct shape.

3.4 LEAK TESTING

A. At least 25% of the ductwork with a design pressure class at least ±3" w.c. shall be leak tested. The A/E or Owner's representative shall select portions of ductwork to be tested.

B. The A/E may require ductwork with a design pressure class less than ±3" w.c. to be leak tested if it appears the ductwork leaks excessively.

C. Testing shall be in accordance with SMACNA HVAC Air Duct Leakage Test Manual. The Contractor shall seal all ductwork which fails leak testing until they are in compliance with the testing standard.

D. Each tested section shall comply with the testing standard.

E. Testing shall be performed at the design pressure class. Testing at a lower pressure is not acceptable.

F. Perform testing prior to the installation of any exterior wrap insulation.

G. Notify A/E at least five days prior to conducting leak testing.

H. Submit results to A/E.

3.5 CLEANING

A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment that could be harmed by excessive dirt with temporary filters, or bypass during cleaning.

END OF SECTION 233100

SECTION 233423 - HVAC POWER VENTILATORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Inline cabinet fans.

1.2 SUBMITTALS

A. See Section 23 0500 – Mechanical General Requirements for submittal procedures.

B. Provide data on fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels at rated capacity, and electrical characteristics and connection requirements. Provide fan curve at multiple RPMs with the operating point clearly marked.

C. Submit manufacturer's installation instructions and start-up instructions.

D. Submit manufacturer’s warranty.

1.3 QUALITY ASSURANCE

A. Performance ratings shall comply with AMCA 210, and bear certified rating seal.

B. Sound ratings shall comply with AMCA 301, and bear certified sound ratings seal.

C. AMCA 99 and NEMA 250 compliant.

D. UL listed and labeled. Designed, manufactured, and tested in accordance with UL 705.

E. Manufacturer shall be a company specializing in manufacturing the type of products specified in this section with a minimum of three years of documented experience.

F. Installer shall be a company specializing in performing the work of this section with a minimum of three years of documented experience.

PART 2 PRODUCTS

2.1 GENERAL

A. Provide direct drive or belt drive fans as scheduled on the contract drawings.

B. Provide gravity or motor operated backdraft damper where specified on the contract drawings. Aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked.

C. Fans shall be factory statically and dynamically balanced in accordance with AMCA 204.

D. Motors shall comply with NEMA MG 1.

E. Provide factory installed, permanently affixed, metal nameplate engraved with the model number and serial number for each fan.

2.2 INLINE CABINET FANS

A. Acceptable Manufacturers:

1. Greenheck
2. Loren Cook
3. PennBarry

B. Centrifugal Fan Unit: V-belt or direct driven, with galvanized steel housing lined with acoustic insulation, resiliently-mounted motor, gravity backdraft damper in discharge.

C. Forward Curved Blower: Direct-driven, resiliently mounted motor, heavy-duty ball bearings, galvanized steel housing for indoor or outdoor service, and removable service panels.

D. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm gets reached with sheaves set at mid-position; fan shaft with self-aligning prelubricated ball bearings.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide backdraft dampers on outlet from cabinet and ceiling exhauster fans and as indicated.

C. Initial start-up shall be performed by trained personnel experienced with installed equipment.

END OF SECTION 233423

SECTION 233700 - AIR OUTLETS AND INLETS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Grilles and registers.

1.2 SUBMITTALS

A. See Section 23 0500 – Mechanical General Requirements for submittal procedures.

B. Provide product data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level. Clearly identify all provided options.

C. Provide project record documents showing actual locations of air outlets and inlets.

1.3 QUALITY ASSURANCE

A. Test and rate air outlet and inlet performance in accordance with ASHRAE Standard 70.

B. Test and rate louver performance in accordance with AMCA 500-L.

C. Manufacturer shall be a company specializing in manufacturing the type of products specified in this section with a minimum of three years of documented experience.

PART 2 PRODUCTS

2.1 GENERAL

A. All air outlets and inlets shall have a maximum NC level of 25 at the design airflow.

B. Air device shall not exceed the sound levels nor air pressure drop of the basis of design selections.

C. Visible fasteners shall be the same color as the air outlet/inlet.

D. Air outlets and inlets in high humidity spaces such as showers shall be fabricated with aluminum. Associated fasteners shall be aluminum or stainless steel.

E. See contract drawings for material, finish color, and size.

F. The Contractor shall ensure border type, mounting type, and fasteners are compatible with ceiling/wall types.

G. Where integral volume dampers are specified, they shall be operable from the face of the air outlet/inlet unless otherwise noted.

2.2 GRILLES, REGISTERS, AND DIFFUSERS

A. Acceptable Manufacturers:

1. Anemostat
2. Behavioral Safety Products
3. Carnes
4. Krueger
5. Metalaire
6. Nailor
7. Price
8. Titus
9. Tuttle and Bailey

B. Antiligature type.

C. See contract drawings for model numbers and additional requirements.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install diffusers to ductwork with airtight connection.

END OF SECTION 233700

SECTION 260500 - ELECTRICAL GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General requirements applicable to all Division 26 Sections.

1.2 DEFINITIONS

A. A/E: Project Architect and/or Engineer.

B. Furnish: To purchase/supply.

C. Install: To place in position and connect complete ready for use.

D. Provide: To furnish and install.

1.3 GENERAL

A. The contract drawings are a diagrammatic representation of the design intent. They do not show every component required for a complete and operational system. The Contractor shall install complete and operational systems based on the design intent.

B. The installation shall comply with the contract documents, applicable codes, manufacturer's installation recommendations, published Owner standards, utility company requirements, and requirements of the AHJ.

1. Notify the A/E in writing of any discrepancies in the contract documents and any of the authorities listed above prior to submitting a bid.
2. If there is a discrepancy between manufacturer's installation recommendations and the contract documents, the manufacturer's recommendations shall take precedence.
3. If there are conflicting requirements in the contract documents, the more restrictive requirement shall govern.

C. Contractor shall apply, procure, and pay for required permits, licenses, inspections, utility service connections (including meters), and any other fees.

1.4 EXAMINATION OF CONTRACT DOCUMENTS

A. The drawings show the design intent diagrammatically. They do not show the exact routing nor every elbow, offset, etc. Do not scale the drawings. The Contractor shall determine the exact installed locations and routing to achieve the design intent. The cost of reasonable adjustments to locations and routing shall be included in the bid. The Contractor shall visit the project site prior to submitting a bid to confirm existing conditions and new work plan of action.

B. Where discrepancies in quantities or sizes exist in the contract documents the greater number shall govern.

C. Verify all dimensions at the jobsite prior to ordering any materials.

1.5 SUBMITTALS

A. Submittals shall be required if requested in applicable specification section or drawings. Submittals will not be reviewed by engineer for specific products if they are not requested in the contract documents.

B. Contractor shall provide separate submittal packages for each specification section. Submittals including multiple specification sections are not acceptable. All items within an individual specification section shall be provided within a single submittal. Providing multiple submittals for a single specification section is not acceptable unless the project has multiple phases.

C. Submittals shall be in PDF format. File name shall include the specification number and description of the submitted item.

D. Content Requirements:

1. Each submittal shall include a cover sheet containing date, project name and number, contractor's name and address, specification number, items submitted, deviations from contract documents, and a blank space for review stamps.
2. Submitted items that have a scheduled equipment tag number on the contract documents shall bear such tag number in the submittal to clearly identify submitted item.
3. Selected options such as model, material, finish, etc. shall be clearly identified.
4. Contractor shall provide review stamp on each submittal, including name of reviewer and date, indicating the content in the submittal has been thoroughly reviewed for completeness and accuracy prior to submitting.
5. Clearly identify deviations, if any, from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.

E. Submittals shall be approved by the A/E prior to ordering items. Approval of submittals does not relieve the contractor's obligation to comply with the contract documents.

F. The A/E reserves the right to invoice the Contractor for time spent for multiple reviews of submittals that are the result of incomplete, inaccurate, or noncompliant submittals being rejected.

1.6 COORDINATION DRAWINGS

A. The contract drawings show the design intent diagrammatically. They do not show the exact utility routing nor every elbow, offset, etc. Where required the Contractor shall

make adjustments to their systems to avoid conflict with the structure and other disciplines. These adjustments shall be made by the construction team prior to the start of construction during their coordination process.

B. Prior to installation, the construction team (including all contractors and subcontractors) shall coordinate proposed utility routing, equipment/device locations, code-required and maintenance clearances, etc. amongst each other to ensure no two objects occupy the same space. Such coordination shall be submitted to the A/E and Owner's Representative in the form of an electronic 3D model or 2D floor plans. The Contractor shall notate any conflicts. The A/E will comment on identified conflicts but will not perform coordination for the construction team.

C. Coordination drawings shall include everything required for a complete installation including, but not limited to, structure, walls, ceilings, equipment, utilities (routing and elevations), components, access panels, hangers, supports, and clearances.

D. 3D models shall be viewable without the need to purchase specialty software other than the Autodesk AEC Collection.

E. 2D floor plans shall be submitted in PDF form. Floor plans shall be of a scale that clearly depicts the installation. Plans that are too congested or unclear will not be accepted. Submit each trade on their own floor plan and all trades overlaid onto one combined floor plan. Each trade's work shall have a distinct color to assist in legibility of combined floor plan.

F. Astral Engineers will provide Revit or AutoCAD electronic files of design models upon request. Such models may be used by contractors as a starting point but must be updated by the construction team during their coordination process. The Contractor shall complete and return waiver (waiver to be provided by Astral Engineers) prior to release of requested documents.

G. Layout shall be coordinated such that the need for additional access panels is avoided, when possible. Additional access panels beyond those shown in the contract documents must be approved by the A/E. If additional access panels are approved by the A/E, they shall be provided at no additional cost.

1.7 MATERIAL SUBSTITUTION

A. The Contractor may submit a request for a material substitution for any item made by a manufacturer not listed as an approved manufacturer in the applicable specification. The request shall include enough information for the A/E to determine if the substituted item is of equal or better performance and quality than that listed in the contract documents.

B. Material substitution requests shall be submitted no later than the last day for pre-bid RFIs.

C. If a material substitution request is not submitted on time, the Contractor may include the substitution as a voluntary substitution on the bid form. Such substitutions will not be considered in determining the low bidder.

D. The Contractor that submitted the material substitution is responsible for any additional costs incurred by other Contractors as a result of the alternate product.

1.8 VALUE ENGINEERING

A. If material or design changes are proposed during construction in an effort to save costs and the Owner agrees to the changes, the Contractor shall pay the design team on a time and material basis to address engineering modifications required.

1.9 WARRANTY

A. Provide a minimum of one-year parts and labor warranty for all fixtures, equipment, components, materials, and workmanship. Longer warranties may be required for certain systems as noted in other specification sections.

B. The warranty period shall start on the date of final acceptance by the Owner. If a newly installed system or piece of equipment is needed to operate the building during construction, the Contractor may agree to a warranty period start date with the Owner that begins prior to the final acceptance of the overall project. The Contractor shall obtain such an agreement in writing from the Owner's Representative.

C. The Contractor shall adjust the systems at seasonal changes, as needed, during the one-year warranty period to prove satisfactory operation during all seasons.

1.10 CHANGE ORDERS

A. Submit a detailed material and labor takeoff for each change order. Identify cost additions and credits based on revised scope. Material costs and required labor hours shall closely align with reputable cost estimating publications. Change orders lacking sufficient breakdown of costs and supporting documentation will be rejected.

B. Do not proceed with change order work until authorized.

PART 2 PRODUCTS

2.1 NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

A. The Contractor is solely responsible for jobsite safety.

B. Work shall be completed by individuals qualified and competent in that specific task.

C. Work that will produce excessive noise shall be completed during unoccupied hours. Coordinate schedule of noisy operations with the Owner's Representative.

D. Install equipment, devices, and components with sufficient clearance to easily maintain parts. Review the final location of equipment with the Owner's Representative prior to setting equipment.

E. Provide factory or field-supplied guard to protect personnel from coming into contact with rotating equipment components.

F. Provide temporary power as needed to support construction activities. Remove temporary power when no longer needed.

G. Provide temporary heaters as needed to prevent construction site from freezing temperatures and potential damage to temperature-sensitive equipment, components, utilities, etc. Remove temporary heaters when no longer needed.

H. Thoroughly clean entire project site prior to final turnover to the Owner.

3.2 PRODUCT HANDLING AND STORAGE

A. The Contractor shall review the required path of travel to navigate equipment, devices, materials, etc. to and from the project area prior to submitting a bid. Overcoming any obstacles shall be accounted for in the bid.

B. Carefully transport and store equipment, devices, materials, etc. to prevent damage. The Contractor shall replace damaged items at no additional cost.

C. Paint equipment and devices that are scratched prior to Owner's acceptance. Paint type and color shall match original.

3.3 OCCUPIED BUILDING UNDER CONSTRUCTION IAQ

A. Coordinate IAQ plan with Owner's Representative throughout construction.

B. The Contractor shall take steps necessary, including those in SMACNA IAQ Guidelines for Occupied Buildings Under Construction, to minimize construction dust/contaminants in order to limit the impact to the air quality of the adjacent occupied areas.

C. Construction activities that produce excessive dust shall be completed during unoccupied hours.

D. The construction site entrance shall not go through the existing building, if possible.

E. Adhesives and sealants shall be tested and compliant with applicable low emitting materials limits.

3.4 A/E JOBSITE OBSERVATIONS

A. The Contractor shall provide one full week notice to the A/E prior to making utility installation inaccessible to allow for visual observation of installed work by A/E. Such

actions include backfilling over underground utilities or closing walls or ceilings containing utilities.

B. By notifying the A/E that the underground, above ceiling, or in wall work is ready for observation, the Contractor is certifying that such work is complete and does not require additional work. This includes, but is not limited to, hangers, supports, insulation, identification, and sealed penetrations. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.

C. IMPORTANT: Astral Engineers must observe the installation of their portion of the design. If observation of such installation is prevented due to the work being covered by backfill, walls, ceilings, etc. prior to observation by Astral Engineers, the Contractor will be required to expose the work so it can be adequately observed.

D. By notifying the A/E that the construction is complete and ready for the final jobsite observation, the Contractor is certifying that such work is complete and does not require additional work. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.

E. Astral Engineers will issue a jobsite observation report after each site visit noting any installation deficiencies, if any. The Contractor shall fix all deficiencies to the satisfaction of the A/E. Provide photographic and/or video evidence of corrected deficiencies signed off if requested by the A/E. The construction schedule shall account for these site visits and required corrections. Schedule extensions will not be allowed to accommodate A/E jobsite observations.

3.5 SYSTEM STARTUP AND TURNOVER

A. The Contractor shall perform complete system startup, calibration, and testing. See manufacturer startup procedures.

B. All operating conditions, control sequences, interlocks, and alarms shall be tested during the startup process.

C. Contractor shall provide verbal and written training for the Owner's representatives regarding the complete maintenance and operation requirements for all systems. Manufacturer personnel shall provide such instruction for major equipment and systems.

3.6 PROJECT CLOSEOUT

A. Operation and Maintenance Manuals:

1. Email a bookmarked electronic copy of the O&M manuals in PDF format to the A/E. All text shall be searchable.
2. Provide the Owner a copy of the O&M manuals on disc or flash drive. Disc or flash drive shall be labeled with project name and “O&M Manual”.
3. Content Requirements:

a. Provide title page with the project name, Architect, Engineers, Contractors, and major equipment suppliers. Include a point of contact for each entity with telephone numbers and email addresses.
b. Provide table of contents with hyperlinks to content within document.
c. Provide parts lists, wiring diagrams, control diagrams, operating procedures, and maintenance schedule and procedures for all systems.
d. Provide all approved submittals, testing reports, equipment startup reports, factory inspection reports, and warranties.
e. Group submittals and other supplemental information with the associated O&M manual to maintain a neat and organized document.

B. Record Documents:

1. The Contractor shall clearly markup drawings to indicate equipment, device, component, and/or utility actual installed location and size. Provide such marked up as-built drawings to A/E at the completion of construction.
2. The Contractor shall clearly markup specifications to indicate any changes to contract specifications based on actual installed conditions. Provide such marked up specifications to A/E at the completion of construction.

END OF SECTION 260500

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SECTION 260505 - ELECTRICAL DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selective demolition.

B. Patching.

1.2 QUALITY ASSURANCE

A. Demolition firm shall be a company specializing in the type of work required with a minimum of five years of documented experience.

PART 2 PRODUCTS

2.1 NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

A. The drawings are diagrammatic and do not show every conduit, fitting, wire, accessory, etc. required to be removed. The Contractor shall visit the site prior to bid submission to verify all field conditions.

B. Comply with other requirements specified in Divisions 01 and 02.

C. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Comply with applicable requirements of NFPA 241.
2. Provide, erect, and maintain temporary barriers and security devices.
3. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
5. Do not close or obstruct roadways or sidewalks without a permit.
6. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

D. Protect existing structures and other elements that are not to be removed.

1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

E. Minimize production of dust due to demolition operations.

F. Install temporary filters over outside air intakes within 100’ of the construction area. If construction activities result in debris affecting existing to remain systems, the Contractor shall completely clean such systems.

G. If hazardous materials are discovered during removal operations, stop work and notify A/E and Owner’s Representative. Hazardous materials include regulated asbestos containing materials, lead, polychlorinated biphenyls, and mercury.

H. Removal of hazardous materials shall comply with 29 CFR 1926 and state and local regulations.

I. Perform demolition in a manner that maximizes salvage and recycling of materials.

1. Dismantle existing construction and separate materials.
2. Set aside reusable, recyclable, and salvageable materials. Store and deliver to collection point or point of reuse.

3.2 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify applicable utility companies before starting work and comply with their requirements.

B. Protect existing utilities to prevent damage.

C. Do not disrupt public utilities without permission from the AHJ.

D. Do not close, shut off, or disrupt existing systems that are in use without at least two weeks prior written notification to the Owner’s Representative.

E. Remove conduit, wire, meters, equipment, hangers, supports, and foundations of disconnected and abandoned utilities.

F. Patch holes resulting from the removal of existing utilities to match existing construction. Provide firestopping as required in fire-rated walls.

3.3 SELECTIVE DEMOLITION

A. Drawings showing existing construction and utilities are based on nondestructive field observation and existing record documents only.

1. Verify that construction and utility arrangements are as indicated.
2. Report discrepancies to A/E before disturbing existing installation.

3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied. Provide, erect, and maintain temporary dustproof, sound retardant partitions separating the construction area and adjacent occupied spaces.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications. Take care to prevent water and humidity damage.

D. Remove existing systems and equipment as indicated and as required to accomplish new work.

1. Existing systems that serve areas outside of the construction area shall remain active. Maintain access to equipment and operational components. Where existing systems must be shut off to allow for new connections, provide at least two weeks prior written notification to the Owner's Representative.
2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
3. Verify that abandoned services serve only abandoned facilities before removal.
4. Remove abandoned equipment, conduits, wires, controls, and associated hangers, supports, accessories, etc. including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.

1. Perform cutting to accomplish removals neatly and as specified for cutting new work.
2. Repair adjacent construction and finishes damaged during removal work.
3. Patch as specified for patching new work.

3.4 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove all materials not to be reused from site.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 260505

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SECTION 260519 - VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Single conductor building wire.

B. Wiring connectors.

C. Accessories.

1.2 SUBMITTALS

A. See Section 26 0500 – Electrical General Requirements for submittal procedures.

B. Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

C. Provide project record documents showing actual installed circuiting arrangements with conductors' size and type. Record actual routing for underground circuits.

D. Provide manufacturers certification stating installation meets or exceeds specified requirements.

E. Manufacturer's installation instructions shall indicate any special procedures.

1.3 QUALITY ASSURANCE

A. Install and test power conductors in accordance with NFPA 70.

B. Power conductors and cables shall comply with UL 44, UL 83, and UL 486.

C. Comply with ASTM.

D. Manufacturer shall be a company specializing in manufacturing the type of products specified in this section with a minimum of five years of documented experience.

E. Installer shall be a company specializing in performing the work of this section with a minimum of five years of documented experience.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Encore Wire Corporation

B. Southwire Company

C. Service Wire Co

D. 3M

E. Ideal Industries, Inc.

2.2 CONDUCTOR AND CABLE GENERAL APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

C. Nonmetallic-sheathed cable is not permitted.

D. Underground feeder and branch-circuit cable is not permitted.

E. Service entrance cable is not permitted.

2.3 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide new conductors and cables manufactured not more than one year prior to installation.

B. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system. Installation shall comply with NFPA 70.

C. Thermoplastic-insulated conductors and cables shall be Listed and labeled as complying with UL 83 and UL 44.

D. Conductors for grounding and bonding shall also comply with Section 26 0526.

E. Conductor Material:

1. Provide copper conductors only. Aluminum conductors are not acceptable.
2. Copper conductors shall be soft drawn annealed, 98% conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787 unless otherwise indicated.
3. Tinned copper conductors shall comply with ASTM B33.

F. Conductor size for 20A branch circuits shall be 12 AWG except on the following instances:

1. 120V circuits longer than 75 feet: 10 AWG.
2. 120V circuits longer than 150 feet: 8 AWG.

G. Control circuits conductor size shall be 14 AWG unless shown otherwise on control wiring diagrams.

H. Conductor sizes shall comply with NFPA 70 and the contract documents.

I. Conductor Color Coding:

1. Maintain consistent color coding throughout project.
2. Conductors that are smaller than 4 AWG shall have integrally colored insulation. Conductors that are 4 AWG and larger shall have vinyl color coding electrical tape.
3. Color Code:
   a. 208Y/120V, 3 Phase, 4 Wire System:
      1) Phase A: Black
      2) Phase B: Red
      3) Phase C: Blue
      4) Neutral/Grounded: White
   b. Equipment Ground: Green

2.4 SINGLE CONDUCTOR BUILDING WIRE

A. Single conductor insulated wire:

1. Conductor stranding for feeders and branch circuits:
   a. Control circuits shall be stranded type.

B. Insulation voltage rating shall be rated for 600V.

C. Insulation for copper building wire shall be THHN/THWN or THHN/THWN-2 Type, except as indicated below.

a. Size 4 AWG and larger shall be XHHW-2 type.
b. Installed underground shall be XHHW-2 type.
c. Fixture wiring within luminaires shall be TFFN/TFN type.

2.5 WIRING CONNECTORS

A. Wiring connectors shall be suitable for use with the conductors to be connected and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Connectors for grounding and bonding shall comply with Section 26 0526.

C. Wiring connectors for splices and taps:

1. Copper conductors size 8 AWG and smaller shall be twist-on insulated spring connectors.
2. Copper conductors size 6 AWG and larger shall be mechanical connectors or insulated compression connectors.

D. Wiring connectors for terminations:

1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
4. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
5. Copper conductors size 8 AWG and larger shall use insulated mechanical connectors or insulated compression connectors where connectors are required.
6. Stranded conductor size 10 AWG and smaller shall use crimped terminals for connections to terminal screws.
7. Conductors for control circuits shall be installed with crimped terminals for all connections.

E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.

F. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.

G. Twist-on insulated spring connectors shall be rated for 600V, 221°F for standard applications and 302°F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.

H. Push-in wire connectors shall be rated 600V, 221°F.

I. Mechanical connectors shall be bolted type or set-screw type.

J. Compression connectors shall be circumferential type or hex type crimp configuration.

K. Crimped terminals shall be nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.

2.6 ACCESSORIES

A. Electrical Tape:

1. Vinyl color coding electrical tape shall match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221°F.
2. Vinyl insulating electrical tape shall comply with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0°F and suitable for continuous temperature environment up to 221°F.
3. Rubber splicing electrical tape shall be ethylene propylene rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil; suitable for continuous temperature environment up to 194°F and short-term 266°F overload service.
4. Electrical filler tape shall be rubber-based insulating moldable putty, minimum thickness of 125 mil; suitable for continuous temperature environment up to 176°F.
5. Varnished cambric electrical tape shall be cotton cambric fabric tape type, with or without adhesive, oil-primed and coated with high-grade insulating varnish; minimum thickness of 7 mil; suitable for continuous temperature environment up to 221°F.
6. Moisture sealing electrical tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.

B. Wire pulling lubricant shall be listed and suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.

C. Cable ties shall be of material and tensile strength rating suitable for application.

PART 3 EXECUTION

3.1 GENERAL

A. Comply with manufacturer’s written data.

B. Verify substrate conditions are acceptable for product installation in accordance with manufacturer’s instructions.

C. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions. Replace any damaged items.

D. Verify that work likely to damage wire and cable has been completed prior to beginning wire installation.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions and NFPA 70.

B. Ship, store, and handle conductors carefully to prevent damage. Inspect conductors prior to installation.

C. Perform work and install support in accordance with NECA 1 (general workmanship).

D. Coordinate exact routing with other trades to minimize length of conductor.

E. Replace materials damaged during installation.

F. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with Section 26 0533.16 and NFPA 70.

G. Circuiting Requirements:

1. Unless dimensioned, circuit routing indicated is diagrammatic.
2. When circuit destination is indicated without specific routing, determine exact routing required.
3. Arrange circuiting to minimize splices.
4. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
5. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
6. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is not permitted.
    a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
    b. Increase size of conductors as required to account for ampacity derating in accordance with NFPA 70.
    c. Size raceways and boxes to accommodate conductors in accordance with NFPA when not indicated on plans.
7. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

H. Installation in Raceway:

1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
2. Pull all conductors and cables together into raceway at same time.
3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

I. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
2. Installation in Vertical Raceways: Provide supports where vertical rise exceeds permissible limits.

J. Install conductors with a minimum of 12” of slack at each outlet.

K. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5’ of slack.

L. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures. Cap conductors accordingly.

M. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures.

N. Make wiring connections using specified wiring connectors.

1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking, or damaging conductors.
3. Do not remove conductor strands to facilitate insertion into connector.
4. Secure mechanical connectors according to manufacturer's recommended torque settings.
5. Secure compression connectors using manufacturer's recommended tools and dies.

O. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to un-spliced conductors.

1. Dry Locations: Provide insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
    a. For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape, followed by outer covering of vinyl insulating electrical tape.
    b. For taped connections likely to require re-entering, including motor leads, first apply varnished cambric electrical tape, followed by adequate amount of rubber splicing electrical tape, followed by outer covering of vinyl insulating electrical tape.

2. Damp Locations: Provide insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
    a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
    b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.

3.3 TESTING

A. Testing shall be performed by trained personnel experienced with installed system.

B. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.

1. Disconnect surge protective devices (SPDs) prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPDs connected.

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Grounding and bonding requirements.

1. Bonding and equipment grounding.

B. Grounding and bonding components.

1.2 QUALITY ASSURANCE

A. Install and test grounding and bonding in accordance with NFPA 70.

B. Grounding and bonding for electrical system shall comply with UL 467.

C. Comply with ASTM.

D. Manufacturer shall be a company specializing in manufacturing the products specified in this section with a minimum of three years of documented experience.

E. Installer shall be a company specializing in performing the work of this section with a minimum of five years of documented experience.

PART 2 PRODUCTS

2.1 GROUNDING AND BONDING REQUIREMENTS

A. Execute the following procedures for existing grounding to be reused:

1. Verify grounding is free from corrosion.
2. Verify integrity and continuity.

B. Do not use products for applications other than as permitted by NFPA 70.

C. Provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

E. Bonding and equipment grounding:

1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials

enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.

2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Raceways may be used as sole equipment grounding conductor where permitted by NFPA 70. Provide insulated equipment grounding conductor where indicated on contract drawings and required by NFPA 70, including but not limited to:
   a. In each nonmetallic feeder and branch circuit raceway.
   b. In each flexible conduit.
4. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
5. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
6. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
7. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
8. Provide bonding for interior metal air ducts.

2.2 GROUNDING AND BONDING COMPONENTS

A. General requirements:

1. Provide products listed, classified, and labeled as suitable for the purpose intended.
2. Provide products listed and labeled as complying with UL 467, where applicable.

B. Conductors for grounding and bonding shall also comply with Section 26 0526:

1. Use insulated copper conductors unless otherwise indicated.
2. Factory pre-fabricated bonding jumpers shall be furnished with factory-installed ferrules; size braided cables to provide equivalent gauge of specified conductors.

C. Connectors for Grounding and Bonding:

1. Connectors shall be appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
2. Unless otherwise indicated, use mechanical connectors, compression connectors for accessible connections.
3. Acceptable manufacturers for mechanical and compression connectors:
   a. Advanced Lightning Technology (ALT)
   b. Burndy
   c. Harger Lightning & Grounding

d. Thomas & Betts Corporation

PART 3 EXECUTION

3.1 GENERAL

A. Comply with manufacturer’s written data.

B. Verify substrate conditions are acceptable for product installation in accordance with manufacturer’s instructions.

C. Receive, inspect, handle, and store grounding equipment in accordance with manufacturer's instructions. Replace any damaged items.

D. Maintain field conditions within manufacturer's required service conditions during and after installation.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions and NFPA 70.

B. Perform work and install support in accordance with NECA 1 (general workmanship).

C. Replace materials damaged during installation.

D. Coordination:

1. Notify A/E of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

E. Make grounding and bonding connections using specified connectors.

1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
3. Make connections using molds and weld material suitable for items to be connected in accordance with manufacturer's recommendations.
4. Provide secure connections according to manufacturer's recommended torque settings for mechanical connectors.
5. Provide secure connections using manufacturer's recommended tools and dies for compression connectors.

END OF SECTION 260526

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SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Support and hanger components.

B. Attachment to structure components.

1.2 QUALITY ASSURANCE

A. Products and installation methods shall comply with applicable codes.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Manufacturer shall be a company specializing in manufacturing products of the type specified in this section with a minimum of three years of documented experience.

D. Installer shall be a company specializing in performing the type of work specified in this section with a minimum of five years of documented experience.

PART 2 PRODUCTS

2.1 GENERAL

A. Components in this section shall comply with the listed manufacturer and specified requirements. Where model numbers are provided they are for reference only. Other models that comply with the product description requirements may also be acceptable.

B. Comply with MSS SP-58 and MSS SP-69 for materials, design, application, and installation.

C. For a given conduit/raceway run, use hangers/supports of the same type and material.

D. Provide complete support/hanging systems for piping and equipment.

E. Where support component types or sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported, include consideration for vibration, equipment operation, and shock loads where applicable.

F. Do not use wire, chain, perforated strap, or wood for permanent pipe supports.

G. Provide corrosion resistant steel finish for support and attachment components as follows:

1. At dry indoor areas provide zinc-plated steel, electroplated in accordance with ASTM B633.
2. At wet/humid indoor/outdoor areas provide galvanized steel, hot-dipped after fabrication in accordance with ASTM A123 or ASTM A153, or stainless steel.
3. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

H. Use straps, clamps, etc. suitable for the conduit/raceway or cable to be supported.

1. Conduit/Raceway straps shall be one-hole or two-hole type; steel or malleable iron.
2. Conduit/Raceway clamps shall be bolted type unless otherwise indicated.

I. Coordinate the work with other trades to provide additional framing and materials required for installation.

2.2 SUPPORT AND HANGER COMPONENTS

A. Hanger Rods:

1. Acceptable Manufacturers:
   a. Anvil
   b. B-line/Eaton
   c. Tolco/Nibco
2. Provide all thread rod, type 304 carbon steel, ASTM A307, grade A. Finish shall comply with requirements specified in Part 2 Products, 'General' in this spec section.
3. See schedules/details within contract drawings for rod size and hanger spacing requirements.

B. Metal Channel (Strut) Framing System:

1. Acceptable Manufacturers:
   a. Unistrut
   b. Eaton/B-Line
   c. Tolco/Nibco
2. Provide factory fabricated continuous-slot metal channel (strut), associated fittings, accessories, and hardware compliant with MFMA-4 for field assembly.
3. ASTM A1011 grade 33, steel. 12-gauge minimum sheet steel thickness. 1-5/8” width by 13/16” high minimum channel dimensions. Finish shall comply with requirements specified in Part 2 Products, 'General' in this spec section.
4. Strut framing systems may be used for:
   a. Uninsulated iron, steel, copper, and rigid plastic service.
   b. Insulated iron, steel, copper, and rigid plastic service.

C. Strut Conduit Clamps (Two Piece):

1. Acceptable Manufacturers:
    a. Unistrut, P1100 series
    b. Eaton/B-Line, B2000 series
    c. Tolco/Nibco, A-14 series
2. Provide ASTM A1011 grade 33. Finish shall comply with requirements specified in Part 2 Products, 'General' in this spec section.
3. Conduit clamps may be used for:
    a. Uninsulated iron, steel, plastic, and bare copper service.
    b. Insulated hot pipe service up to 3".

D. Strut Conduit Clamps (Single Piece):

1. Acceptable Manufacturers:
    a. Unistrut, P2500 series
    b. Eaton/B-Line, B2400 series
    c. Tolco/Nibco, 2STR series
2. Provide ASTM A1011 grade 33, MSS SP-58 & MSS SP-69, type 26. Finish shall comply with requirements specified in Part 2 Products, 'General' in this spec section.
3. Conduit clamps may be used for:
    a. RMC,IMC, and EMT.

E. Conduit Hangers with Threaded Hole:

1. Acceptable Manufacturers:
    a. Hubbell - RACO.
    b. Halex.
    c. Bridgeport.
2. Hangers supplied with a retained bolt.

2.3 ATTACHMENT TO STRUCTURE COMPONENTS

A. Applications:

1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications:
    a. Concrete, use preset concrete inserts, expansion anchors, or screw anchors.
    b. Solid or Grout-Filled Masonry, use expansion anchors or self-tapping masonry screws. Do not fasten to masonry joints.
    c. Hollow Masonry, use toggle bolts.
    d. Hollow Stud Walls, use toggle bolts.
    e. Steel, use beam clamps, machine bolts, or welded threaded studs. Precautions shall be taken to prevent fire and smoke damage during and after welding.
    f. Sheet Metal, use sheet metal screws.

g. Wood, use wood screws.
h. Nails are permitted for attachment of nonmetallic boxes to wood frame construction (when specified).
i. Staples are permitted for attachment of nonmetallic-sheathed cable to wood frame construction (when specified).
j. Plastic and lead anchors are not permitted.
k. Hammer-driven anchors and fasteners are not permitted.

B. Post-installed Concrete and Masonry Anchors:

1. Acceptable Manufacturers:
   a. Hilti
   b. ITW Red Head
   c. Simpson Strong-Tie
2. Provide anchors per Appendix D of ACI-318-18, evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES).

C. Preset Concrete Inserts, Single Rod:

1. Acceptable Manufacturers:
   a. Anvil, 282
   b. Eaton/B-line, B3014
   c. Erico, 355
2. Malleable iron body and nut, MSS SP-58, type 18. Zinc Plated finish.

D. Preset Concrete Inserts, Continuous Strut:

1. Acceptable Manufacturers:
   a. Unistrut, P3200 Series
   b. B-Line/Eaton, B22-J Series
   c. Erico, CONB122000PG
2. Continuous galvanized steel channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors compliant with MFMA-4. Steel sheet, 12-gauge minimum channel thickness.

E. Beam Clamp, C-Type for Wide Flange Beams:

1. Acceptable Manufacturers:
   a. Anvil International, 92
   b. B-Line/Eaton, B3033/B3034
   c. Erico, 300
2. Provide ASTM A36 carbon steel or ASTM A181 forged steel, MSS SP-58, type 19 and 23.

F. Beam Clamp, Scissor Type for Bar-Joists and Flange:

1. Acceptable Manufacturers:

a. Anvil International, 228, 292
b. B-Line/Eaton, B3054
c. Erico, model 360

2. Provide ASTM A36 carbon steel or ASTM A181 forged steel, MSS SP-58, type 28 and 29.

PART 3 EXECUTION

3.1 GENERAL

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive support and attachment components.

C. Verify that conditions are satisfactory for installation prior to starting work.

D. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

E. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.

F. Coordinate the arrangement of supports with ductwork, piping, equipment, and other potential conflicts installed under other sections by others.

G. Notify A/E of any conflicts with or deviations from contract documents. Obtain direction before proceeding with work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Provide conduit/raceway/equipment supports to prevent stress, swaying, sagging, buckling, and vibration.

C. Provide conduit/raceway/equipment supports to allow for expansion and contraction.

D. Horizontal conduit routing shall be installed to allow for vertical adjustment for aligning purposes.

E. Provide trapeze supports for parallel horizontal conduits/raceways or for single conduit/raceway when hung below an obstruction in which a single hanger cannot be installed.

F. After conduit/raceway installation is complete, cut hanger rods at trapeze supports to a max 3/4” below the bottom of the lowest fastener, smooth any sharp edges.

G. Supports shall attach directly to the building structure or engineered supplemental supports. Supporting pipe/equipment from other piping, ductwork, conduit or other nonstructural supplemental support is not permitted.

H. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured.

I. Do not penetrate or otherwise notch or cut structural members without approval of the project Structural Engineer.

J. Conduit/raceway supports shall be installed prior to structural steel fireproofing. If supports are installed after, the Contractor shall replace any damaged sections of fireproofing done during the installation.

K. Preset Concrete Inserts: Use manufacturer-provided closure strips to inhibit concrete seepage during concrete pour.

L. Secure fasteners according to manufacturer's recommended torque settings.

M. Remove temporary supports after permanent support systems have been installed.

N. All thread rod sizes and hanger spacing shall be meet the requirements of MSS SP-58, MSS SP-69, and the applicable code, whichever is more stringent. See contract documents for rod size/minimum spacing schedules.

3.3 FIELD QUALITY CONTROL

A. Inspect support and attachment components for damage and defects.

B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

C. Scrape and brush clean pipe support members welded to structural framing. Provide one coat of zinc primer after the cleaning process is complete.

D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION 260529

SECTION 260533.13 - CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Flexible metal conduit (FMC).

B. Liquidtight flexible metal conduit (LFMC).

C. Electrical metallic tubing (EMT).

D. Accessories.

1.2 SUBMITTALS

A. See Section 26 0500 – Electrical General Requirements for submittal procedures.

B. Provide manufacturer's standard catalog pages and data sheets for conduits, including detailed information on materials, construction, ratings, listings, and available sizes, and configurations.

C. Manufacturer's installation instructions shall indicate any special procedures.

1.3 QUALITY ASSURANCE

A. Install conduits in accordance with NFPA 70.

B. Conduits shall comply with UL 514B.

C. Manufacturer shall be a company specializing in manufacturing the type of products specified in this section with a minimum of five years of documented experience.

D. Installer shall be a company specializing in performing the work of this section with a minimum of five years of documented experience.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Allied Tube & Conduit

B. Nucor Tubular Products

C. Western Tube

D. Bridgeport Fittings

E. Thomas & Betts

F. Champion Fiberglass

2.2 CONDUIT GENERAL APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.

C. Concealed within masonry walls shall be galvanized electrical metallic tubing (EMT).

D. Concealed within hollow stud walls shall be galvanized electrical metallic tubing (EMT).

E. Concealed above accessible ceilings shall be galvanized electrical metallic tubing (EMT).

F. Connections to luminaires above accessible ceilings shall be flexible metal conduit.

1. Maximum Length shall be 6’.

G. Connections to vibrating equipment:

1. Dry locations shall use flexible metal conduit.
2. Damp, wet, or corrosive locations shall be liquid tight flexible metal conduit.
3. Maximum length shall be 6’ unless otherwise indicated.

2.3 CONDUIT GENERAL REQUIREMENTS

A. Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.

B. Fittings for grounding and bonding shall Also comply with Section 26 0526.

C. Minimum conduit size, unless otherwise indicated:

1. Branch circuits shall be 3/4” minimum trade size.
2. Branch circuit homeruns shall be 3/4" minimum trade size.
3. Control circuits shall be 1/2” minimum trade size.
4. Flexible connections to luminaires shall be 3/8” minimum trade size.

D. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.4 FLEXIBLE METAL CONDUIT (FMC)

A. NFPA 70, type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.

B. Fittings shall comply with NEMA FB 1 and be listed and labeled as complying with UL 514B. Material shall be steel or malleable iron.

2.5 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. NFPA 70, type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

B. Fittings shall comply with NEMA FB 1 and be listed and labeled as complying with UL 514B. Material shall be steel or malleable iron. Do not use die cast zinc fittings.

2.6 ELECTRICAL METALLIC TUBING (EMT)

A. NFPA 70, type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:

1. Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material shall be steel or malleable iron. Do not use die cast zinc fittings.
3. Connectors and couplings shall be compression (gland) or set-screw type. Do not use indenter type connectors and couplings.
4. Damp or wet locations (where permitted) shall be fittings listed for use in wet locations.
5. Embedded within concrete (where permitted) shall be fittings listed as concrete-tight. Fittings that require taping to be concrete-tight are acceptable.

2.7 ACCESSORIES

A. Pull strings shall use nylon cord with average breaking strength of not less than 200 pound-force.

B. Sealing compound for sealing fittings shall be listed for use with the particular fittings to be installed.

C. Modular seals for conduit penetrations shall be rated for minimum of 40 psi; suitable for the conduits to be installed.

D. Firestop sleeves shall be listed; provide as required to preserve fire resistance rating of building elements.

PART 3 EXECUTION

3.1 GENERAL

A. Comply with manufacturer’s written data.

B. Verify substrate conditions are acceptable for product installation in accordance with manufacturer’s instructions.

C. Receive, inspect, handle, and store conduit in accordance with manufacturer's instructions. Replace any damaged items.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions and NFPA 70.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Coordinate exact routing with other trades to minimize length of conduit.

D. Replace materials damaged during installation.

E. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conduits in NFPA 70.

F. Install electrical nonmetallic tubing (ENT) in accordance with NECA 111.

G. Install liquidtight flexible nonmetallic conduit (LFNC) in accordance with NECA 111.

H. Conduit Routing:

1. Unless dimensioned, conduit routing indicated is diagrammatic.
2. When conduit destination is indicated without specific routing, determine exact routing required.
3. Conceal all conduits unless specifically indicated to be exposed.
4. Conduits in the following areas may be exposed, unless otherwise indicated on drawings:
    a. Electrical rooms.
    b. Mechanical equipment rooms.
    c. Within joists in areas with no ceiling.
5. Unless otherwise approved, do not route conduits exposed:
    a. Across floors.
6. Arrange conduit to maintain adequate headroom, clearances, and access.
7. Arrange conduit to provide no more than the equivalent of four 90° bends between pull points.
8. Arrange conduit to provide no more than 150’ between pull points.
9. Route conduits above water and drain piping where possible.

10. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
11. Maintain minimum clearance of 6” between conduits and piping for other systems.
12. Maintain minimum clearance of 12” between conduits and hot surfaces. This includes, but is not limited to:
    a. Heaters.
    b. Hot water piping.
    c. Flues.
13. Group parallel conduits in the same area together on a common rack.

I. Conduit support:

1. Secure and support conduits in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide required vibration isolation and/or seismic controls in accordance with Section 26 0548.
3. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
4. Provide support from ceiling support system for installation above suspended ceilings. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
5. Use conduit strap to support single surface-mounted conduit.
    a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
6. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
7. Use conduit clamp to support single conduit from beam clamp or threaded rod.
8. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
9. Use of spring steel conduit clips for support of conduits is not permitted.
    a. Support of electrical metallic tubing (EMT) up to 1” trade size concealed above accessible ceilings and within hollow stud walls.
10. Use of wire for support of conduits is not permitted.
    a. For securing conduits to studs in hollow stud walls.
    b. For suspending conduits supported by spring steel conduit clips (only where specifically indicated or permitted).
11. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with the most stringent requirements.

J. Connections and terminations:

1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.

2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
6. Where spare conduits stub up through concrete floors and are not terminated in a box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.
7. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
8. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

K. Penetrations:

1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
6. Provide metal escutcheon plates for conduit penetrations exposed to public view.
7. Provide firestopping to preserve fire resistance rating of partitions and other elements.

L. Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:

1. Where conduits cross structural joints intended for expansion, contraction, or deflection.

M. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12” at each end.

3.3 FIELD QUALITY CONTROL

A. Correct deficiencies and replace damaged or defective conduits.

B. Clean interior of conduits to remove moisture and foreign matter.

END OF SECTION 260533.13

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SECTION 260533.16 - BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Outlet and device boxes up to 100 cu. In., including those used as junction and pull boxes.

B. Accessories.

1.2 QUALITY ASSURANCE

A. Install boxes for electrical systems in accordance with NFPA 70.

B. Boxes shall comply with NEMA ratings and shall be UL listed type.

C. Manufacturer shall be a company specializing in manufacturing the type of products specified in this section with a minimum of five years of documented experience.

D. Installer shall be a company specializing in performing the work of this section with a minimum of five years of documented experience.

PART 2 PRODUCTS

2.1 BOXES GENERAL APPLICATIONS

A. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.

B. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

E. Provide grounding terminals within boxes where equipment grounding conductors terminate.

2.2 BOXES

A. Outlet and device boxes up to 100 cu. in., including those used as junction and pull boxes:

1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.

2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
3. Use suitable concrete type boxes where flush-mounted in concrete.
4. Use suitable masonry type boxes where flush-mounted in masonry walls.
5. Use raised covers suitable for the type of wall construction and device configuration where required.
6. Use shallow boxes where required by the type of wall construction.
7. Do not use "through-wall" boxes designed for access from both sides of wall.
8. Sheet-steel boxes shall Comply with NEMA OS 1, and list and label as complying with UL 514A.
9. Cast metal boxes shall comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
10. Boxes for supporting luminaires and ceiling fans shall be listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
11. Boxes for ganged devices shall be multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
12. Wiring devices (other than communications systems outlets) shall be 4” square by 1-1/2” deep trade size.
13. Ceiling outlets shall be 4” octagonal or square by 1-1/2” deep trade size.
14. Acceptable Manufacturers:
    a. Cooper Crouse-Hinds
    b. Hubbell Incorporated; Bell Products
    c. Hubbell Incorporated; RACO Products.
    d. O-Z/Gedney
    e. Thomas & Betts

PART 3 EXECUTION

3.1 GENERAL

A. Comply with manufacturer’s written data.

B. Verify substrate conditions are acceptable for product installation in accordance with manufacturer’s instructions.

C. Receive, inspect, handle, and store boxes and fittings in accordance with manufacturer's instructions.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions and NFPA 70.

B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.

C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with section 26 0533.16 and NFPA 70.

D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

E. Provide separate boxes for emergency power and normal power systems.

F. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.

G. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.

H. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.

I. Box Locations:

1. Locate boxes to be accessible. Provide access panels where approved by the A/E.
2. Unless dimensioned, box locations indicated are approximate.
3. Locate boxes as required for devices installed under other sections or by others.
    a. Switches, receptacles, and other wiring devices shall comply with Section 26 2726.
4. Locate boxes so that wall plates do not span different building finishes.
5. Locate boxes so that wall plates do not cross masonry joints.
6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6” horizontal separation unless otherwise indicated.
8. Fire resistance rated walls shall be install flush-mounted boxes such that the required fire resistance will not be reduced.
    a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24” separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.
    b. Do not install flush-mounted boxes with area larger than 16 sq.in. or such that the total aggregate area of openings exceeds 100 sq. in. for any 100 sq. ft. of wall area.
9. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points.

10. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the A/E:
    a. Concealed above accessible suspended ceilings.
    b. Within joists in areas with no ceiling.
    c. Electrical rooms.
    d. Mechanical equipment rooms.

J. Box supports:

1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction and by structural design details.
2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
3. Installation above suspended ceilings shall have support from ceiling grid or ceiling support system.
4. Use far-side support to secure flush-mounted boxes supported from single stud in hollow stud walls. Repair or replace supports for boxes that permit excessive movement.

K. Install boxes plumb and level.

L. Flush-mounted boxes:

1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4” or does not project beyond finished surface.
2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8” at the edge of the box.

M. Install boxes as required to preserve insulation integrity.

N. Install firestopping to preserve fire resistance rating of partitions and other elements.

O. Close unused box openings.

P. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

3.3 FIELD QUALITY CONTROL

A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

B. Correct deficiencies and replace damaged or defective boxes.

C. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION 260533.16

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SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Electrical identification requirements.

B. Wire and cable markers.

C. Voltage markers.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Brady Corporation

B. Brimar Industries

C. Craftmark

D. Kolbi Pipe Marker Co.

E. Seton

2.2 GENERAL

A. All identifying text shall be typewritten. Handwritten text is not acceptable.

1. Exceptions:
    a. Spare breaker schedule shall be marked with erasable pen.
    b. Use identification labels, handwritten text using indelible marker, or plastic marker tags to identify circuits enclosed in 4” square junction boxes.
    c. Use identification labels, handwritten text using indelible marker, or plastic marker tags to identify spare conduits at each end. Identify purpose and termination location.

B. Provide identification nameplate to identify equipment utilizing series ratings, where permitted, in accordance with NFPA 70.

C. Use identification nameplate to identify switchboards and panelboards utilizing a high leg delta system in accordance with NFPA 70.

D. Use identification nameplate to identify disconnect location for equipment with remote disconnecting means. See NFPA 70 for identification nameplate requirements.

E. Use identification label on inside of door at each motor controller to identify nameplate horsepower, full load amperes, code letter, service factor, voltage, and phase of motor(s) controlled.

F. Identification for conductors and cables:

1. Color coding for power conductors 600V and less shall comply with Section 26 0519.
2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
3. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
    a. At each source and load connection.
    b. Within boxes when more than one circuit is present.
    c. Within equipment enclosures when conductors and cables enter or leave the enclosure.

G. Identification for boxes:

1. Use voltage markers to identify highest voltage present.
2. Use identification label or engraved wall plate to identify serving branch circuit for all receptacles.
    a. For receptacles in public areas or in areas as directed by A/E, provide identification on inside surface of wall plate.
3. Use identification label or engraved wall plate to identify load controlled for wall-mounted control devices controlling loads that are not visible from the control location and for multiple wall-mounted control devices installed at one location.
4. Use identification label to identify receptacles protected by upstream GFI protection, where permitted.

2.3 ELECTRICAL IDENTIFICATION REQUIREMENTS

A. Unless specifically excluded, identify existing elements to remain in accordance with this spec section.

PART 3 EXECUTION

3.1 GENERAL

A. Degrease and clean surfaces to receive identification materials.

B. Provide conduit markers for all conduit systems including abandoned conduits. Abandoned conduit shall be identified as “ABANDONED”.

3.2 INSTALLATION

A. Install in accordance with manufacturer’s instructions.

B. Install voltage markers at 20’ spacing maximum, ceiling penetration, and in accordance with ANSI/ASME A13.1.

END OF SECTION 260553

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SECTION 262726 - WIRING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall switches.

B. Receptacles.

C. Wall plates.

1.2 SUBMITTALS

A. See Section 26 05 00 for submittal procedures.

B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

C. Field Quality Control Test Reports.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

E. Project Record Documents: Record actual installed locations of wiring devices.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Screwdrivers for Tamper-Resistant Screws: Two for each type of screw.

1.3 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Products: Listed, classified, and labeled as suitable for the purpose intended.

1.4 DELIVERY, STORAGE, AND PROTECTION

A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

PART 2 PRODUCTS

2.1 WIRING DEVICE APPLICATIONS

A. Provide wiring devices suitable for intended use and with ratings adequate for load served.

B. Provide GFCI protection for receptacles serving electric drinking fountains.

2.2 WIRING DEVICE FINISHES

A. Provide wiring device finishes as described below unless otherwise indicated.

B. Wiring Devices: galvanized steel wall plate. Device color selection by Architect.

2.3 WALL SWITCHES

A. Manufacturers:

1. Hubbell Incorporated.
2. Leviton Manufacturing Company, Inc.
3. Pass & Seymour, a brand of Legrand North America, Inc.

B. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.

C. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

2.4 RECEPTACLES

A. Manufacturers:

1. Hubbell Incorporated.
2. Leviton Manufacturing Company, Inc.
3. Lutron Electronics Company, Inc.
4. Pass & Seymour, a brand of Legrand North America, Inc.

B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
2. NEMA configurations specified are according to NEMA WD 6.

C. Convenience Receptacles:

1. Tamper Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type; single or duplex as indicated on the drawings.

D. GFCI Receptacles:

1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
   a. Provide test and reset buttons of same color as device.
2. Standard GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
3. Tamper Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type.

2.5 WALL PLATES

A. Wall Plates: Comply with UL 514D.

1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
2. Size: Standard
3. Screws: Metal with tamper-resistant heads finished to match wall plate finish.
4. Provide screwless wallplates with concealed mounting hardware.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.

C. Verify that wall openings are neatly cut and will be completely covered by wall plates.

D. Verify that final surface finishes are complete, including painting.

E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

F. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of wiring devices provided under this section.

1. Mounting Heights (centerline of device): Unless otherwise indicated, as follows:
    a. Wall Switches: 48 inches above finished floor.
    b. Receptacles: 48 inches above finished floor.

C. Install wiring devices in accordance with manufacturer's instructions.

D. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.

E. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

F. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

G. Install wiring devices plumb and level with mounting yoke held rigidly in place.

H. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.

I. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

J. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

3.4 FIELD QUALITY CONTROL

A. Inspect each wiring device for damage and defects.

B. Test each receptacle to verify operation and proper polarity.

C. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.

D. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.5 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.6 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION 262726

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SECTION 265100 - INTERIOR LIGHTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Interior luminaires.

B. Ballasts and drivers.

C. Accessories.

1.2 SUBMITTALS

A. See Section 013300 for submittal procedures.

B. Shop Drawings:

1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
2. Provide photometric calculations where luminaires are proposed for substitution upon request.

C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.

1. LED Luminaires:
   a. Include estimated useful life, calculated based on IES LM-80 test data.

D. Field quality control reports.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

G. Project Record Documents: Record actual connections and locations of luminaires and any associated remote components.

1.3 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.4 DELIVERY, STORAGE, AND PROTECTION

A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.

B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.5 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.6 WARRANTY

A. See Section 26 05 00 for additional warranty requirements.

B. Provide 3-year manufacturer warranty for LED luminaires, including drivers.

PART 2 PRODUCTS

2.1 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

2.2 LUMINAIRES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Recessed Luminaires:

1. Ceiling Compatibility: Comply with NEMA LE 4.
2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.

H. LED Luminaires:

1. Components: UL 8750 recognized or listed as applicable.
2. Tested in accordance with IES LM-79 and IES LM-80.
3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

2.3 BALLASTS AND DRIVERS

A. Ballasts/Drivers - General Requirements:

1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.

B. Dimmable LED Drivers:

1. Dimming Range: Continuous dimming from 100 percent to five percent relative light output unless dimming capability to lower level is indicated, without flicker.
2. Control Compatibility: Fully compatible with the dimming controls to be installed.

2.4 ACCESSORIES

A. Fire-Rated Luminaire Enclosures:

1. Provide as required to preserve fire resistance rating of building elements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

C. Verify that suitable support frames are installed where required.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of luminaires provided under this section.

B. Install products in accordance with manufacturer's instructions.

C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).

D. Provide required support and attachment in accordance with Section 260529.

E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

F. Suspended Ceiling Mounted Luminaires:

1. Do not use ceiling tiles to bear weight of luminaires.
2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
3. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
4. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.

G. Recessed Luminaires:

1. Install trims tight to mounting surface with no visible light leakage.

H. Install accessories furnished with each luminaire.

I. Bond products and metal accessories to branch circuit equipment grounding conductor.

3.4 FIELD QUALITY CONTROL

A. See Section 26 05 00 for additional requirements.

B. Inspect each product for damage and defects.

C. Operate each luminaire after installation and connection to verify proper operation.

D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

3.5 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.

3.6 CLEANING

A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.7 PROTECTION

A. Protect installed luminaires from subsequent construction operations.

END OF SECTION 265100

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