

PROJECT MANUAL

BID SET

UNIVERSITY MEDICAL CENTER

OR-8/Hybrid Operating Room

Lubbock, Texas



UMC HEALTH SYSTEM

April | 2024

Parkhill Project # 03904922

UMC Project # 2024-01

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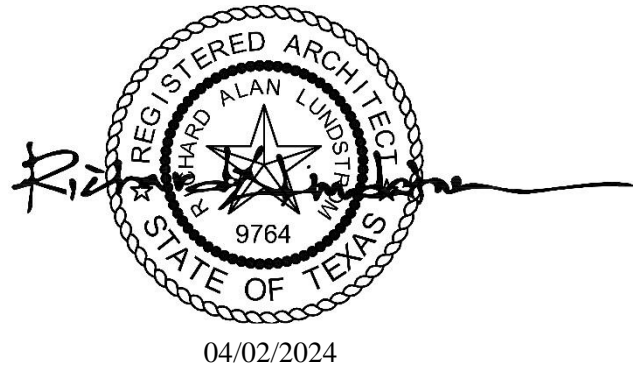
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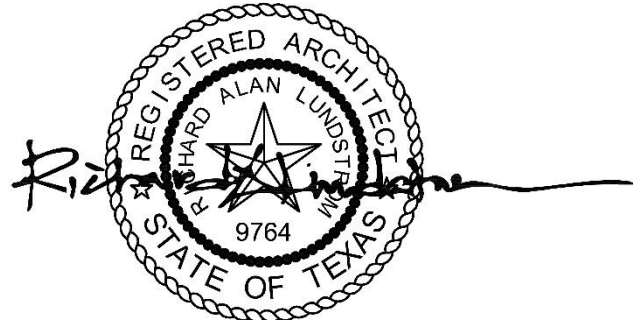
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- 23 33 00 Air Duct Accessories
- 23 37 13 Diffusers, Registers, and Grilles

DIVISION 25 - INTEGRATED AUTOMATION

Not Used



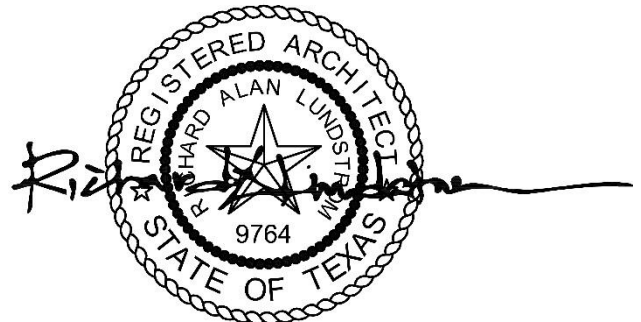
04/02/2024

DIVISION 26 - ELECTRICAL

- 26 05 00 Basic Electrical Methods
- 26 05 05 Selective Demolition for Electrical
- 26 05 13 Building Wire and Cable
- 26 05 19 Equipment Wiring Systems
- 26 05 26 Grounding and Bonding
- 26 05 29 Supporting Devices
- 26 05 33 Conduit
- 26 05 33.16 Boxes
- 26 05 53 Electrical Identification
- 26 27 26 Wiring Devices
- 26 28 16.16 Enclosed Switches
- 26 51 00 Interior Lighting

DIVISIONS 27 - 48

Not Used



04/02/2024

DESIGN PROFESSIONAL RESPONSIBILITY

The Specification Sections authenticated by my seal and signature are limited to the following:

DIVISION 09 - FINISHES

- 09 65 13 Prefabricated Resilient Cove Base
- 09 65 20 Rubber Sheet Flooring and Base
- 09 72 16.16 Rigid Sheet Vinyl Wall Coverings
- 09 91 23 Interior Painting

DIVISION 12 - FURNISHINGS

- 12 36 61.16 Solid Surfacing Countertops



04/02/2024

DESIGN PROFESSIONAL RESPONSIBILITY

The Specification Sections authenticated by my seal and signature are limited to the following:

DIVISION 21 - FIRE SUPPRESSION

- 21 13 00 Sprinkler Systems
- 21 13 00.20 Fire Protection Piping

DIVISION 22 - PLUMBING

- 22 60 13 Medical Gas and Vacuum Systems

DIVISION 23 - MECHANICAL

- 23 05 00 General Mechanical Requirements
- 23 05 00.20 Basic Mechanical Materials and Methods
- 23 05 29 Hangers and Supports for HVAC Piping and Equipment
- 23 05 53 Mechanical Identification
- 23 05 93 Testing, Adjusting, and Balancing
- 23 07 13 Ductwork Insulation
- 23 09 23 Direct-Digital Control System for HVAC
- 23 31 00 HVAC Ducts and Casings
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- 26 05 33.16 Boxes
- 26 05 53 Electrical Identification
- 26 27 26 Wiring Devices
- 26 28 16.16 Enclosed Switches
- 26 51 00 Interior Lighting



DOCUMENT 00 11 19 - REQUEST FOR PROPOSALS

1.1 OWNER

University Medical Center
602 Indiana Avenue
Lubbock, Texas 79415

1.2 PROJECT

University Medical Center
OR-8/Hybrid Operating Room
602 Indiana Avenue
Lubbock, Texas

1.3 ARCHITECT

Parkhill
4222 85th Street
Lubbock, Texas 79423

1.4 DESCRIPTION

- A. University Medical Center (UMC) is soliciting Competitive Sealed Proposals (CSP) for finish upgrade and equipment replacement in Operating Room 8/Hybrid Operating Room.
- B. You are invited to submit a proposal for furnishing of all labor, materials, services, and equipment necessary for and incidental to the Work as called for on the Drawings and in the Project Manual.
- C. A contract will be awarded based on which proposal offers the best value to the Owner for the Project after the evaluation and ranking of proposals as described in the Instructions to Proposers.
- D. Estimated Construction Budget: \$950,000 building construction excluding equipment.

1.5 BASIS OF PROPOSALS

- A. Proposals shall be made on the attached forms for furnishing of all labor, materials, services, and equipment necessary for and incidental to the Work as called for on the Drawings and in the Project Manual.
- B. Owner will be utilizing the Competitive Sealed Proposal procurement method as authorized by Texas Government Code, Title 10, Subtitle F., Chapter 2269, Subchapter D. The selection criteria used to evaluate each Proposer's Proposal is stipulated in Section 00 21 16 "Instructions to Proposers," Article 6.4.

1.6 SUBMISSION OF PROPOSALS

- A. Owner will receive Proposals until the given time, date, and location. Owner will consider Proposals prepared in compliance with the Instruction to Proposers issued by the Owner, and delivered as follows:
 - 1. Proposals will be accepted as a sealed submittal in hardcopy. Proposals will also be received electronically by sending as an email attachment directly to: Rocky De Hoyos at Rocky.De.Hoyos@umchealthsystem.com in either format, proposals are due at the given time, date, and location.

- B. Proposal Due Date: Tuesday, April 30, 2024
- C. Proposal Due Time: 3:00 p.m., local time.
- D. Sealed Proposal shall be Delivered to:

University Medical Center
Business and Technology Center
309 N. Slide Road
Lubbock, Texas 79416
Attn: Rocky De Hoyos
Contract Administrator
University Medical Center
Rocky.De.Hoyos@umchealthsystem.com
806.761.0827

- E. Sealed or emailed Proposals will be received until the time and date specified for receipt.
- F. Any Proposals received after the deadline will be returned to the sender unopened.
- G. After receipt, only the names of Proposers and monetary amount of the proposals will be made public.

1.7 PROPOSAL DOCUMENTS

- A. Public Advertisements for this Project have been placed in the local newspaper on Sunday, March 31, 2024, and Sunday, April 7, 2024.
- B. Electronic Proposal Documents may be acquired from the office of the Architect beginning Tuesday, April 2, 2024 at 2:00 p.m. or after, and at the following plan rooms the same day:
 - 1. Associated General Contractors
1707 W. 8th Street
Amarillo, Texas 79105
806.374.1954
sandy@agcamarillo.com
 - 2. Dodge Data and Analytics
806.794.2722
www.construction.com
 - 3. AGC Plan Room
4500 W Illinois, Suite 201
Midland, Texas 79703
432.520.2220
midland@wtagc.org
- C. General Contractors may secure an electronic copy of Proposal Documents from Parkhill 4222 85th Street, Lubbock, Texas 79423 as follows:
 - 1. Download documents (.PDF file extension format) from the Parkhill Info Exchange website after registering as a plan holder with issuing Parkhill office. No cost or deposit required for this option.
- D. Only Proposers who obtain Proposal Documents through Parkhill will be registered as a document holder (plan holder) and will therefore automatically receive addenda if/when issued. Other Proposers, not registered as a document holder, can request addenda directly from Parkhill. Addenda will be automatically issued to the local plan rooms listed above.
- E. Proposal Documents will not be provided to subcontract proposer.
- F. No partial sets will be issued.

1.8 ADDENDA

- A. Addenda will be issued to document holders by one of the following methods:
 - 1. E-mail notification to document holder with link to download addenda from the Parkhill Info Exchange website.
 - 2. For document holders without e-mail, addenda may be picked up at the issuing office or mailed via the United States Postal Service (USPS).
- B. Addenda will not be faxed to document holders.

1.9 PRE-PROPOSAL CONFERENCE (General Contractors)

- A. A pre-proposal conference tentatively will be held Tuesday, April 9, 2024 at 3:00 p.m., local time at the UMC Main Tower, 302 Indiana Avenue. Attendance by prospective Proposers is mandatory. Current construction has closed the Main Lobby and is diverted into the building. Gather in area of North Elevators prior to 3:00.
- B. Any Proposer that does not attend, or does not sign in at the conference, will be considered absent.
- C. Each firm must pre-register for the mandatory on-site tour. Please register with Kim Biggs at Parkhill (kbiggs@parkhill.com) prior to the designated time for the tour.

1.10 PROPOSAL SECURITY

- A. Proposal Security in the sum of 5 percent of the total Proposal amount and in the form of a cashier's check, certified check, or Surety Bond, shall accompany all Proposals as stipulated in the Instruction to Proposers.

1.11 OPENING OF PROPOSALS

- A. Proposals will be received on the same day and same time, Tuesday, April 30, 2024 at 3:00 p.m., CST, as specified in the Project Manual. UMC will open Proposals and read aloud at the UMC Business & Technology Center.
- B. No interviews will be conducted for this Proposal.
- C. Within 45 days of opening the Proposals, the designated Selection Committee will convene in closed session to evaluate and rank each Proposal with respect to the published Selection Criteria. The designated Selection Committee shall select the highest ranked Proposer that submits the Proposal that offers the best value for the Owner based on the published selection criteria and point system. The Owner shall first attempt to negotiate a contract with the selected Proposer. The Owner may discuss with the selected Proposer options for a scope or time modification and any price change associated with the modification. Other than the data read at the Proposal opening, the Owner shall not disclose any information derived from the Proposals submitted by competing Proposers in conducting such discussions.
- D. If the Owner is unable to negotiate a satisfactory contract with the selected Proposer, the Owner shall formally and in writing, end negotiations with that Proposer and proceed to negotiate with the next Proposer in the order of the selection ranking until a contract is reached or negotiations with all ranked Proposers end.
- E. If the Owner negotiates a contract with a selected Proposer, the Owner will present the negotiated contract to the Owner's Finance Committee for recommendation of approval to the Owner's Board of Managers or directly to the Owner's Board of Managers.
- F. It is the intent of the Owner to enter into a contract with the selected Proposer at the earliest scheduled Board Meeting (anticipated to be Monday, May 27, 2024 at the May Board Meeting).

- G. Following the Owner's award of a contract or Proposal rejection action, the Proposers will be notified by facsimile or e-mail message.
- H. The award or rejection action regarding this Proposal is at the sole discretion of the Owner and the Owner makes no warranty regarding this Proposal that a contract will be awarded to any Proposer.
- I. The Owner agrees that if the Contract is awarded, it will be awarded to the Proposer offering the best value to the Owner. The Owner is not bound to accept the lowest priced Proposal if that Proposal is judged not to be the best value for the Owner, as determined by the Owner based on the selection criteria stated in the Request for Proposals.

1.12 PROPOSAL EVALUATION COMMITTEE

- A. The Evaluation Committee will be composed of the following people:

Richard Lundstrom	Parkhill/Senior Architect
Yvonne Strain	Parkhill/Architect
David Sublett	Timshel Global Services
Jason Schulte	UMC Project Manager
Tim McLean	UMC Project Manager
- B. All questions concerning the Proposal shall be directed in writing to Richard Lundstrom, Parkhill at rlundstrom@parkhill.com. Requests for Drawings shall be directed to Kim Biggs, Parkhill at kbiggs@parkhill.com.

1.13 FORMALITIES

- A. The Owner reserves the right to waive irregularities and to reject all Proposals.
- B. Any interlineations or notation on any submitted Proposal Form must be initiated by the signer or the signer's designee for the Proposal at the time of such marking.
- C. Any interlineations or notation on the envelope and/or cover of the submitted proposal must be initiated by the signer or the signer's designee of the Proposal at the time of such marking.

1.14 APPLICABLE GOVERNING LAWS AND REGULATIONS

- A. In accordance with the Instruction to Proposers, all Proposers shall comply with State Labor Laws concerning prevailing wage rates. All information, documentation, and other material submitted by vendor under this Proposal may be subject to public disclosure under the Texas Open Records Act (Texas Government Code, Chapter 552). Proposer is hereby notified that UMC strictly adheres to this statute and the interpretations thereof rendered by the Courts and Texas Attorney General. Proposer shall be deemed to have knowledge of this law and how to protect its legitimate interests. **REQUIRED PIA STATEMENT:** The requirements of Subchapter J, Chapter 552, Government Code, may apply to this bid and the contractor or vendor agrees that the contract can be terminated if the contractor or vendor knowingly or intentionally fails to comply with a requirement of that subchapter.

1.15 PERFORMANCE, PAYMENT, AND PROPOSAL BONDS

- A. As a part of this Proposal, each Proposer shall provide a Letter of Intent to issue Performance and Payment Bonds from the Proposer's bonding company listing availability of current bonding capacity and amount of Work currently under bond. The Proposer shall establish through this letter the ability to provide the bonds in the amount of the published budget and schedule.

- B. Before beginning the Work and, in any case, within 10 days after the Contract is signed, the successful Proposer shall furnish Performance and Payment Bonds to the owner for 100 percent of the Guaranteed Maximum Price and in accordance with Texas Government Code Chapter 2253.
- C. In addition to the Performance and Payment Bonds, the Proposer shall provide a good and sufficient Proposal bond in the amount of 5 percent of the total estimated Contract price. A Proposal bond must be executed with a surety company authorized to do business in this state. See “Instructions to Proposers,” Section 5.2, “Proposal Security.”

1.16 CONSTRUCTION SCHEDULE

- A. It is the intent of the Owner to issue Notice to Proceed within 2 weeks of the Board of Manager’s approval of the Proposal, pending release of building permit. Contractor “may” be allowed to begin mobilizing for Work prior to Notice to Proceed based on Owner direction at the time. Substantial Completion Date is to be determined by Competitive Proposal.

END OF SECTION

DOCUMENT 00 21 16 - INSTRUCTIONS TO PROPOSERS

ARTICLE 1 – DEFINITIONS

- 1.1 **Proposal Documents** include the Proposal Requirements and the proposed Contract Documents.
- 1.1.1 **Proposal Requirements** consist of the Advertisement of Proposals, Instructions to Proposers, the Proposal Form, and other sample proposal and contract forms.
- 1.1.2 **Contract Documents** consist of the Form of Agreement between the Owner and Contractor, Conditions of the Contract, Drawings, Project Manual that includes Specification Sections, and all Addenda issued prior to execution of the Contract.
- 1.2 **Definitions** set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Proposal Documents.
- 1.3 **Addenda** are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Proposal Documents by additions, deletions, clarifications, or corrections.
- 1.4 A **Proposal** is a complete and properly signed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Proposal Documents.
- 1.5 The **Base Proposal** is the sum stated in the Proposal for which the Proposer offers to perform the Work described in the Proposal Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Proposals.
- 1.6 An **Alternate Proposal** (or Alternate) is an amount stated in the Proposal to be added to or deducted from the amount of the Base Proposal if the corresponding change in the Work, as described in the Proposal Documents, is accepted.
- 1.7 **Unit Price** is an amount stated in the Proposal as a price for measurement of materials, equipment or services or a portion of the Work as described in the Bidding Documents.
- 1.8 **Proposer** is a person or entity who submits a Proposal.
- 1.9 **Sub-proposer** is a person or entity who submits a proposal to a Proposer for materials, equipment, or labor for a portion of the Work.

ARTICLE 2 – PROPOSER’S REPRESENTATIONS

- 2.1 Proposer, by making a Proposal, represents that:
- 2.1.1 Proposer has read and understands the Proposal Documents and the Proposal is made in accordance therewith.
- 2.1.2 Proposer has read and understands the Proposal Documents or Contract Documents, to the extent that such documentation related to the Work for the Proposal is submitted.

- 2.1.3 Proposer has visited the site and become familiar with local conditions under which the Work is to be performed and has correlated the Proposer's personal observations with the requirements of the proposed Contract Documents.
 - 2.1.3.1 Proposer should be familiar with the adjacent working conditions. The Operating Room and surgical suite is currently occupied; access will be controlled and limited by Owner operations.
- 2.1.4 The Proposal is based upon the materials, equipment and systems required by the Proposal Documents without exception.

ARTICLE 3 - PROPOSER COMMUNICATIONS

- 3.1 *Except as provided in this Proposal* and as otherwise necessary for the conduct of ongoing UMC business operations, Proposers are expressly and absolutely prohibited, directly or indirectly, from engaging in communications with system personnel who are involved in any manner in the review and/or evaluation of the proposals, selection of a proposer, and/or negotiation or formalization of any agreement or any other UMC person, including members of the Board of Managers, officers, agents, or other employees of UMC. **IF ANY PROPOSER ENGAGES IN CONDUCT OR COMMUNICATIONS THAT UMC DETERMINES IS CONTRARY TO THE PROHIBITIONS SET FORTH IN THIS SECTION, UMC MAY, AT ITS SOLE DISCRETION, DISQUALIFY THE PROPOSER AND WITHDRAW THE PROPOSER'S PROPOSAL FROM CONSIDERATION.**
- 3.2 UMC is committed to operating in an ethical and lawful manner. In addition to established policies and procedures for the resolution of concerns regarding UMC operations, UMC has selected a hotline service (EthicsPoint) for use by our employees, patients and their families, physicians, and other individuals/parties. The EthicsPoint hotline service is for any concern, including but not limited to compliance, patient care and safety, HIPAA privacy/security, Human Resources, workplace safety, vendor relations. The information provided to EthicsPoint will be sent to UMC on a confidential basis. While reporters can remain anonymous, leaving contact information is often helpful in investigating reports. Proposers who have concerns about inappropriate proposal activity may report those concerns to the EthicsPoint hotline by phone at 1.888.329.6445 or by website at <https://secure.ethicspoint.com/domain/media/en/gui/23121/index.html>. Proposers may also contact UMC's Chief Compliance Officer directly at 806-761-0995.

ARTICLE 4- PROPOSAL DOCUMENTS

- 4.1 COPIES
 - 4.1.1 Proposers may obtain complete digital sets of the Proposal Documents from Parkhill as stated in the Advertisement for Proposals.
 - 4.1.2 Proposal Documents will not be issued directly to Sub-proposers or others unless specifically offered in the Advertisement for Proposals.

- 4.1.3 Proposers shall use complete sets of Proposal Documents in preparing Proposals; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Proposal Documents.
- 4.1.4 In making copies of the Proposal Documents available on the above terms, the Owner and the Architect do so only for the purpose of obtaining Proposals on the Work and do not confer a license or grant permission for any other use of the Proposal Documents.

4.2 INTERPRETATION OR CORRECTION OF PROPOSAL DOCUMENTS

- 4.2.1 The Proposer shall carefully study and compare the Proposal Documents with each other, and with other work being proposed concurrently or presently under construction to the extent that it relates to the Work for which the Proposal is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.
- 4.2.2 Proposers and Sub-proposers requiring clarification or interpretation of the Proposal Documents shall make a written request which shall reach the Architect at least 7 days prior to the date for receipt of Proposals.
- 4.2.3 Interpretations, corrections, and changes of the Proposal Documents will be made by Addendum. Interpretations, corrections, and changes of the Proposal Documents made in another manner will not be binding, and Proposers shall not rely upon them.

4.3 SUBSTITUTIONS

- 4.3.1 Materials, products, and equipment described in the Proposal Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.
- 4.3.2 No substitution will be considered prior to receipt of Proposals unless written request for approval has been received by the Architect at least 7 days prior to the date for receipt of Proposals (no later than 5:00 p.m., Tuesday, April 23, 2024). Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including Drawings, performance and test data, and other information necessary for an evaluation. An item by item (line by line) comparison of each item listed in the Specification shall be compiled and submitted comparing specified material/product with proposed substitution. A statement setting forth changes in other material, equipment, or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the Proposer. Architect approval is for manufacturer only, and not specific material, system, or equipment. Approved manufacturer's material, system, or equipment is subject to additional and final review after award of contract and submitted for Architect's approval during Construction

Administration submittal/Shop Drawing review process. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

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

4.3.4 No substitutions will be considered after the Contract award unless otherwise specifically noted in the Proposal Documents.

4.4 ADDENDA

4.4.1 Addenda will be issued via Architect's Newforma Info Exchange website, or by email or mail (if internet service is not available) to all who are known by the issuing office to have received a complete set of Proposal Documents. See Section 1.8 of the document titled Request for Proposals.

4.4.2 Copies of Addenda will be made available for inspection wherever Proposal Documents are on file for that purpose.

4.4.3 No Addenda will be issued later than 2 days prior to the date for receipt of Proposals except an Addendum withdrawing the Request for Proposals or which includes postponement of the date for receipt of Proposals.

4.4.4 Each Proposer shall ascertain, prior to submitting a Proposal, that the Proposer has received all Addenda issued, and the Proposer shall acknowledge their receipt in the Proposal.

ARTICLE 5 – PROPOSAL PROCEDURES

5.1 FORM AND STYLE OF PROPOSALS

5.1.1 Proposals shall be bound, include a table of contents, information located behind tabs, and the requested information shall be organized and numbered (lettered) in the exact order as the selection criteria as listed in table titled "AWARD SELECTION CRITERIA" in Section 6.4.1 below.

5.1.2 Proposals shall be submitted on forms identical to the form included with the Proposal Documents.

5.1.3 All blanks of the Proposal Form shall be filled in by typewriter or manually, in ink.

5.1.4 Where so indicated by the makeup of the Proposal Form, sums shall be expressed in both words and figures, and in case of discrepancy between the two, the amount written in words shall govern.

- 5.1.5 Interlineations, alterations, and erasures on any Proposal Form or envelope that contains any Proposal whether handwritten, typed, or printed, must be initialed by the signer of the Proposal or the signer's designee, or the Proposal may be considered invalid.
- 5.1.6 All requested Alternates shall be proposed. If no change in cost to the Base Proposal is required, mark "No Change."
- 5.1.7 Each copy of the Proposal shall include the legal name of the Proposer and a statement that the Proposer is a sole proprietor, partnership, corporation, or other legal entity. Each copy shall be signed by a person or persons legally authorized to bind the Proposer to a contract. A Proposal by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Proposal submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Proposer.
- 5.1.8 All costs associated with the preparation, submission, and delivery of Proposal is the sole responsibility of the Proposer.
- 5.1.9 The Proposer shall make no stipulations on the Proposal Form nor qualify the Proposal in any manner. Refer also to 5.1.5 above.

5.2 PROPOSAL SECURITY

- 5.2.1 Each Proposal shall be accompanied by a Proposal Security as stipulated in the Advertisement for Proposals, in the form and amount required, pledging that the Proposer will enter into a Contract with the Owner on the terms stated in the Proposal and will furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Proposer refuse to enter into such Contract, or fail to furnish such bonds, the amount of the Proposal Security shall be forfeited to the Owner as liquidated damages, not as a penalty.
- 5.2.2 The Surety bond shall be written on AIA Document A310, Proposal Bond, or a similar standard for of the Surety, and the attorney-in-fact who executes the bond on behalf of the Surety, shall affix to the bond a certified and current copy of the power of attorney.
- 5.2.3 The Owner shall have the right to retain the proposal security of Proposers to whom an award is being considered until either (a) the Contract has been executed and bonds have been furnished, or (b) the specified time has elapsed so that Proposals may be withdrawn, or (c) all Proposals have been rejected.

5.3 SUBMISSION OF PROPOSALS

- 5.3.1 All copies of the Proposal, the Proposal Security and other documents required to be submitted with the Proposal shall be enclosed in a sealed opaque envelope. The envelope shall be addressed as indicated in the Invitation for Proposals and shall be identified with the Project name, the Proposer's name and address. If the Proposal is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED PROPOSAL ENCLOSED" on the

face thereof. Any other interlineations or notations on the envelope must be initiated by the Proposal signer or the signer's designee at the time of the interlineations or notations, or the Proposal may be considered invalid.

- 5.3.2 Proposals shall be deposited at the designated location prior to the time and date for receipt of Proposals. Proposals received after the time and date for receipt of Proposals will be returned unopened.
- 5.3.3 The Proposer shall assume full responsibility for timely delivery at the location designated for receipt of Proposals.
- 5.3.4 Oral, telephonic, or telegraphic Proposals are invalid and will not receive consideration. Electronic Proposals may be emailed directly to UMC as described in Request for Proposals and will be accepted if received prior to the time and date designated for receipt of Proposals.
- 5.3.5 The Proposer shall be responsible for all costs associated with preparing the Competitive Sealed Proposal (CSP) Document response. The Owner and Architect shall not incur any costs associated with the production and printing of Proposer's Proposal Document and post proposal information.
- 5.3.6 The Proposer shall prepare 5 copies of the proposal information which will be sealed in an opaque envelope, or 1 digital copy if submitted by email.

5.4 MODIFICATION OR WITHDRAWAL OF PROPOSAL

- 5.4.1 A Proposal may not be modified, withdrawn, or canceled by the Proposer during the stipulated time period following the time and date designated for the receipt of Proposals except as described in "Request for Proposals," Section 1.11, subsections C and D, and each Proposer so agrees in submitting a Proposal.
- 5.4.2 Prior to the time and date designated for receipt of Proposals, a Proposal submitted may be modified or withdrawn by notice to the party receiving Proposals at the place designated for receipt of Proposals. Such notice shall be in writing over the signature of the Proposer or the Proposer's designee or by email; if by email, written confirmation over the signature of the Proposer shall be mailed and postmarked on or before the date and time set for receipt of Proposals. A change shall be so worded as not to reveal the amount of the original Proposal.
- 5.4.3 Withdrawn Proposals may be resubmitted up to the date and time designated for the receipt of Proposals provided that they are then fully in conformance with these Instructions to Proposers.

ARTICLE 6 – CONSIDERATION OF PROPOSALS

6.1 OPENING OF PROPOSALS

6.1.1 As described in Request for Proposals, properly sealed or emailed Proposals, delivered on time, will be opened and read publicly starting at 3:00 p.m., CST. Names of Proposers and their proposed costs will be read aloud. Refer to Request for Proposals for call-in instructions.

6.2 REJECTION OF PROPOSALS

6.2.1 The Owner shall have the right to reject any, or all Proposals, reject a Proposal not accompanied by a required proposal security, or by other data required by the Proposal Documents, or reject a Proposal which is in any way incomplete or irregular.

6.2.2 The Owner shall have the right to reject any Proposal, in whole or in part, that proposes an Alternate if the Owner determines in its sole discretion that the Alternate proposed lacks sufficient information in the Proposal to address structural integrity and feasibility.

6.3 ACCEPTANCE OF PROPOSAL (AWARD)

6.3.1 After privately reviewing the opened Proposals, the designated Selection Committee will evaluate and rank each Proposal with respect to the published selection criteria in the section titled “Selection Criteria and Scoring Methodology.” The designated Selection Committee shall select the highest ranked Proposer that submits the proposal that offers the best value for the Owner based on the published selection criteria and point system. The Owner shall first attempt to negotiate a contract with the selected Proposer. The Owner may discuss with the Proposer options for a scope or time modification and any price change associated with the modification. Other than the data read at the Proposal opening, the Owner shall not disclose any information derived from the Proposals submitted by competing proposers in conducting such discussions.

6.3.2 If the Owner is unable to negotiate a satisfactory contract with the selected Proposer, the Owner shall formally and in writing, end negotiations with that Proposer and proceed to negotiate with the next Proposer in the order of the selection ranking until a contract is reached or negotiations with all ranked Proposers end.

6.3.3 Owner shall have the right to accept or reject Alternates and/or Voluntary Alternates, if any, in any order or combination unless otherwise specifically provided in the Proposal Documents, and to determine the low Proposer on the basis of the sum of the Base Proposal and any Alternate accepted.

6.3.4 Each Proposer agrees to waive any claim it has or may have against the Owner, the Architect, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any Proposal.

6.4 SELECTION CRITERIA AND SCORING METHODOLOGY

6.4.1 Proposers will be selected using a weighted value that is explained below for each category of the Selection Criteria. The weighted value system assigns a specific ratio of valuation to each specific Proposal relative to the base line lowest price proposed. The following explanation describes how the weighted value is determined for each selection criteria:

AWARD SELECTION CRITERIA		
Criteria	Weighting Value	Methodology
Construction Cost	40%	Each proposed bid will be divided by LOW bid for a cost differential (ratio). CALCULATED FINAL SCORE on PRICE is based on the calculated ratio multiplied by weighting factor of 30. Maximum possible score on price = 30.0
Schedule (duration - calendar days to construct)	25%	Each proposed schedule (duration in calendar days) will be divided by LOW duration for a days' differential (ratio). CALCULATED FINAL SCORE on SCHEDULE (duration) is based on the calculated ratio multiplied by weighting factor of 30. Maximum possible score on price = 30.0
Proposed Team (including HUB Subcontracting Plan) & Healthcare Experience <ul style="list-style-type: none"> • Specific and relevant to this Project healthcare experience of Proposed Team, and commitment of Proposed Team for duration of this specific Project. • Experience of Proposed Team of UMC Projects and record of timely completion and on budget. 	35%	Designated Selection Committee will collectively evaluate and score each Proposal based on all relevant information. Criteria to be evaluated may include the factors listed in the left column under Criteria. <u>Note: Proposed HUB Plan must be submitted to UMC within 24 hours of the designed time for opening of Proposals, and can be</u>

<ul style="list-style-type: none"> • Past experience of Team on UMC Projects, and satisfaction of the performance of the Team with UMC internal clients (Department Director – direct Users of the space). • List of Subcontractors, including HUB Subcontracting Plan, and major Material Suppliers. • The HUB Subcontracting Plan must meet the requirements under 34 Texas Administrative Code § 20.285. <p>Information and forms are available from the first individual listed in Section 12.B of the Request for Proposals.</p>		<p><u>delivered in 1 of the designated manners as the Proposals.</u></p>
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SCORING METHOD	
BASE SCORE	<p>Criteria on Proposed Team & Healthcare Experience will be scored by the Selection Committee on a qualitative basis with the following scoring system:</p> <p>Outstanding/Superior - 10.0 points Very Good - 8.0 points Acceptable - 6.0 points Fair/Poor - 4.0 points Unacceptable - 2.0 points No information - 0.0 points</p>
FINAL CUMULATIVE WEIGHTED SCORE	<p>Addition of final score based on adding individual scores for Cost, Schedule and Qualifications.</p>
FINAL RANKING	<p>Final ranking of Proposals based on final scoring of Proposals based on Final Cumulative Weighted Score.</p>

ARTICLE 7 – POST-PROPOSAL INFORMATION

7.1 CONTRACTOR’S QUALIFICATION STATEMENT

7.1.1 Proposers to whom award of a Contract is under consideration shall submit to the Architect, upon request, a properly executed AIA Document A305 – Contractor’s Qualification Statement.

7.2 SUBMITTALS

7.2.1 The Proposer shall, as soon as practical, after notification of selection for the award, furnish to the Owner through the Architect in writing:

- a. A designation of the Work to be performed with the Proposer’s own forces;
- b. Names of the manufacturers, products and the suppliers of principal items or systems of materials and equipment proposed for the Work; and
- c. Names of subcontractors, persons, or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

7.2.2 The Proposer will be required to establish, to the satisfaction of the Architect and Owner, the reliability and responsibility of the persons or entities proposed to furnish and perform the work described in the Proposal Documents.

ARTICLE 8 – PERFORMANCE BOND AND PAYMENT BOND

8.1 BOND REQUIREMENTS

8.1.1 The Proposer shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

8.1.2 The cost of bonds shall be included and identified in the Proposal.

8.2 TIME AND DELIVERY OF BONDS

8.2.1 The Proposer shall deliver the required bonds to the Owner prior to beginning the Work and, in any case, within 10 after the contract is signed.

8.2.2 The bonds shall be written on AIA Document A312, Performance Bond and Payment Bond or the Bonding Company's standard bond forms. Both bonds shall be written in the amount of the Contract Sum.

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

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

ARTICLE 9 – INSURANCE REQUIREMENTS

- 9.1 **General Insurance Requirements.** Unless otherwise stated in the General Conditions or Special Conditions of the Contract (refer to attached Exhibit A), the successful Proposer (“Contractor”) shall furnish insurance in the types and amounts indicated in this Request for the duration of the Contract. If a conflict arises between insurance amounts listed in this Section and Exhibit A, provide the HIGHER amount of the 2.
- 9.1.1 The required insurance shall include coverage for Owner’s property for preparation prior to construction, during construction and during the warranty period.
- 9.1.2 The insurance shall be evidenced by delivery to Owner of certificates of insurance executed by the insurer or its authorized agent stating coverages, limits, expiration dates and compliance with all applicable required provisions.
- 9.1.3 Coverage shall be written on an occurrence basis by companies authorized and admitted to do business in the State of Texas and rated A- or better by A.M. Best Company or similar rating company or otherwise acceptable to Owner.
- 9.1.4 Policies must include the following clauses, as applicable:
- a. This insurance shall not be canceled, materially changed, or nonrenewed except after 30 days written notice has been given to Owner.
 - b. It is agreed that Contractor’s insurance shall be deemed primary with respect to any insurance or self-insurance carried by Owner for liability arising out of operations under the Contract with Owner.
 - c. Owner, its officials, directors, employees, representatives, and volunteers are added as additional insureds as respects operations and activities of, or on behalf of the named insured performed under Contract with Owner. The additional insured status must cover completed operations as well. This is not applicable to workers’ compensation policies.
 - d. A waiver of subrogation in favor of Owner shall be provided in all policies.
- 9.2 **Workers’ Compensation.** Insurance with limits as required by the Texas Workers’ Compensation Act, with the policy endorsed to provide a waiver of subrogation as to Owner, employer’s liability insurance of not less than: \$100,000 each accident; \$100,000 disease each employee ; and \$500,000 disease policy limit. Workers’ compensation insurance coverage must meet the statutory requirements of Tex. Lab. Code § 401.011(44) and specific to construction projects for public entities as required by Tex. Lab. Code § 406.096.

9.3 Commercial General Liability. Including premises, operations, independent contractor's liability, products and completed operations and contractual liability, covering, but not limited to, the liability assumed under the indemnification provisions of the Contract, fully insuring Contractor's liability for bodily injury (including death) and property damage with a minimum limit of:

\$1,000,000 per occurrence;
\$2,000,000 general aggregate;
\$2,000,000 products and completed operations aggregate;
and Coverage shall be on an "occurrence" basis.

The policy shall include coverage extended to apply to completed operations and explosion, collapse, and underground hazards. The policy shall include endorsement CG2503 Amendment of Aggregate Limits of Insurance (per Project) or its equivalent.

9.4 Asbestos Abatement Liability Insurance. Including coverage for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos containing materials. This requirement applies if the Work or the Project includes asbestos containing materials.

9.4.1 The combined single limit for bodily injury and property damage will be a minimum of \$1,000,000 per occurrence.

9.4.2 Specific requirement for claims-made form: Required period of coverage will be determined by the following formula: continuous coverage for life of the Contract, plus 1 year (to provide coverage for the warranty period), and an extended discovery period for a minimum of 5 years which shall begin at the end of the warranty period.

9.4.3 Employer's liability limits for asbestos abatement will be:

- \$500,000 each accident;
- \$500,000 disease each employee; and
- \$500,000 disease policy limit.

9.4.4 If this Contract is for asbestos abatement only, the all-risk builder's risk or all-risk installation floater is not required.

9.5 Comprehensive Automobile Liability Insurance. Covering owned, hired, and non-owned vehicles, with a minimum combined single limit for bodily injury (including death) and property damage of \$1,000,000 per occurrence. No aggregate shall be permitted for this type of coverage.

9.5.1 Such insurance is to include coverage for loading and unloading hazards.

9.5.2 Contractor or any subcontractor responsible for transporting asbestos or other hazardous materials defined as asbestos shall provide pollution coverage for any vehicle hauling asbestos containing cargo. The policy must include a Pollution Endorsement.

- 9.6 All-Risk Builder's Risk Insurance. Coverage shall be all-risk, including, but not limited to, fire, extended coverage, vandalism and malicious mischief, theft and, if applicable, flood, earth movement and named storm.
- 9.6.1 Builder's risk and installation floater limits shall be equal to 100 percent of the Contract Sum plus, if any, existing property and Owner-furnished equipment specified by Owner.
- 9.6.2 The policy shall be written jointly in the names of Owner and Contractor. Subcontractors shall be named as additional insureds.
- 9.6.3 The policy shall have endorsements as follows:
- a. This insurance shall be specific as to coverage and not contributing insurance with any permanent insurance maintained on the property.
 - b. This insurance shall not contain an occupancy clause suspending or reducing coverage should Owner partially occupy the Site and before the parties have determined Substantial Completion.
 - c. Loss, if any, shall be adjusted with and made payable to Owner as trustee for the insureds as their interests may appear. Owner shall be named as loss payee.
 - d. For renovation projects or projects that involve portions of Work contained within an existing structure, the Insurance and Bond Exhibit may have additional builder's risk insurance requirements.
 - e. For Owner furnished equipment or materials that will be in care, custody or control of Contractor, Contractor will be responsible for damage and loss.
 - f. For those properties located within a Tier 1 or 2 windstorm area, named storm coverage must be provided with limits specified by Owner.
 - g. For those properties located in flood prone areas, flood insurance coverage must be provided with limits specified by Owner.
 - h. Builder's risk insurance policy shall remain in effect until Substantial Completion.
- 9.7 "Umbrella" Liability Insurance. Contractor shall obtain, pay for and maintain umbrella liability insurance during the Contract term, insuring Contractor for an amount of not less than amount specified in the Insurance and Bonds Exhibit that provides coverage at least as broad as and applies in excess and follows form of the primary liability coverages required hereinabove. The policy shall provide "drop down" coverage where underlying primary insurance coverage limits are insufficient or exhausted.
- 9.8 Delivery and Form. The Contractor shall deliver the required certificates of insurance coverage to the Owner upon its execution of the Contract. The insurance certificate shall be written on a form acceptable to the Owner. Insurance shall be written in the amount required by the Contract. The insurance certificates shall be dated on or before the date of the Contract.

ARTICLE 10 – FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

- 10.1 The Agreement for the Work will be written on AIA A101-2017, Standard form of Agreement between Owner and Contractor where the basis of payments is a Stipulated Sum.

ARTICLE 11 – APPLICABLE GOVERNING LAWS AND REGULATIONS

11.1 WAGE RATES

11.1.1 All Proposers must comply with State Labor Laws as required by current amended provisions of Tex. Gov't Code, Chapter 2258. A Contractor is required to pay not less than the prevailing wage rate of per diem wages of the various applicable classes of labor.

11.1.2 A Contractor shall forfeit as a penalty to the Owner, \$60.00 for each worker employed for each calendar day or portion thereof, if such worker is paid less than the said stipulated rates for any Work done under said Contract, by the Contractor or by their subcontractor.

11.1.3 Refer to Section 00 73 43 "Wage Rate Requirements" for additional information.

11.2 NON-DISCRIMINATION

During the Bidding and, if successful, during performance of the Contract, the Proposer agrees they shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, or national origin. The Proposer shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, sex, religion, age, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Proposer agrees to post in conspicuous places, available to employees or applicants for employment, notices to be provided setting forth the provisions of this non-discrimination Article.

END OF SECTION

DOCUMENT 00 42 00 - PROPOSAL FORM

Date: _____ 20 _____

University Medical Center
309 N. Slide Road
Lubbock, Texas 79416

The undersigned, having carefully examined the Specifications, Drawings, and related documents entitled:

UNIVERSITY MEDICAL CENTER
OR-8/HYBRID OPERATING ROOM
602 INDIANA AVENUE
LUBBOCK, TEXAS

all as prepared by Parkhill, as well as having attended a pre-proposal conference, and made an on-site inspection of the premises and all other conditions affecting the cost and/or execution of the Work, proposes to furnish all materials, labor, and equipment necessary to complete the Work in accordance with said Documents, of which this Proposal is a part, for the following sum:

BASE COST PROPOSAL: _____
_____ Dollars (\$ _____)

(**Note:** All amounts shall be shown in both written and figure form. In case of discrepancy between the written amount and the figure, the written amount will govern. For Alternates, check whether it is an add, deduct, or no change.)

We have included in the Proposal sum all applicable taxes and material allowances.

The undersigned acknowledges receipt of _____ Addenda to the Drawings and Project Manual as follows:

No.	Date	No.	Date	No.	Date
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

(The Proposer is to fill in I.D. Number and date of each thereby acknowledging receipt of Addenda).

If awarded the Contract, the undersigned agrees to commence Work under this Contract on or before a date to be specified in Written Notice to Proceed and to substantially complete the Project within _____ (Proposer to fill in number) **calendar days** from said commencement date, unless modified by Change Order.

Proposer agrees to pay the Owner **\$1,000.00** per day, as liquidated damages, for each day the Substantial Completion of this Project extends beyond the stipulated Substantial Completion date.

Proposer acknowledges by initialing they recognize Owner's intent to contract directly with control subcontractor (JCI), and Proposer's (and team) scope of Work will be in coordination with Owner's controls contractor: _____

If notified of the acceptance of this proposal, Proposer agrees within 10 days of notification, to execute a contract in the form of the AIA Document A101-2017, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is A Stipulated Sum, as amended for the above work, for the above stated compensation.

PROPOSAL SECURITY, as defined in the Request For Proposals and Instructions to Proposers, which the Undersigned agrees to disposition of, as stated in Request For Proposals and Instructions to Proposers, is attached to this Proposal.

Upon acceptance of this Proposal by Owner, Contractor shall furnish, before beginning the Work and, in any case, no later than 10 days after of the signing of the Contract, a PERFORMANCE BOND AND LABOR/MATERIAL PAYMENT BOND, in the amount of 100 percent of the Contract Price. Surety shall meet requirements specified in the Owner/Contractor Agreement.

ATTACHMENTS

In accordance with Instructions to Proposers, the following documents will be submitted with and made a condition of the Proposal:

Proposal Security in form of _____
Proposer's qualifications statement and supporting data.

The Procurement Form Supplement is included to and made a condition of the Proposal:

Respectfully Submitted,

By: _____

Title: _____

Business Address with Zip Code

(SEAL: If Proposal is
by Corporation)

Telephone Number with Area Code _____

FAX Number with Area Code _____

Fill in the applicable information:

A Corporation, chartered in the State of _____.

Authorized to do business in the State of Texas.

A Partnership, composed of _____, and

_____ and _____.

An Individual operating under the name of _____

_____.

Corporate Seal:

END PROPOSAL FORM

DOCUMENT 00 43 00 - PROCUREMENT FORM SUPPLEMENT

To: University Medical Center
309 N. Slide Road
Lubbock, Texas 79416
Attn: Lacy Sebastian, UMC Purchasing Manager, Supply Chain

Project: University Medical Center
OR-8/Hybrid Operating Room
602 Indiana Avenue
Lubbock, Texas

Date: _____

Submitted by: _____

(full name) _____

(full address) _____

In accordance with the Instructions to Proposers and the Proposal Form, we include the Proposal Form Supplements listed below. The information provided shall be considered an integral part of the Proposal Form.

Please provide the following information:

1. Mechanical Subcontractor (Included in Proposal Amount):

Firm Name: _____

Address: _____

Phone No.: _____

Fax No.: _____

Contact: _____

1a. Mechanical Subcontractor (First Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Fax No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle 1)

1b. Mechanical Subcontractor (Second Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Fax No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle 1)

2. Plumbing Subcontractor (Included in Proposal Amount):

Firm Name: _____

Address: _____

Phone No.: _____

Fax No.: _____

Contact: _____

2a. Plumbing Contractor (1st Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Fax No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle 1)

2b. Plumbing Contractor (2nd Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Fax No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle 1)

3. Electrical Subcontractor (Included in Proposal Amount):

Firm Name: _____

Address: _____

Phone No.: _____

Fax No.: _____

Contact: _____

3a. Electrical Contractor (1st Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Fax No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle 1)

3b. Electrical Contractor (2nd Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Fax No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle 1)

By submitting this Form, signed below by authorized signing officer under the Proposer information on the Proposal Form, information contained within shall amend the Proposal.

Respectfully Submitted,

By: _____

Title: _____

SECTION 00 52 00 – AGREEMENT FORM

PART 1 - GENERAL

1.1 APPLICABLE DOCUMENT

- A. The Agreement for the Work will be written on the Sample Agreement Form indicated below and that follows this Section.
1. AIA A101-2017, Standard Form of Agreement between Owner and Contractor where the basis of payment is a Stipulated Sum.
 2. Owner standard revisions to AIA A101 Standard Agreement.
 3. Exhibit A – Insurance and Bonds.
 4. Exhibit B – Changes in the Work.
 5. Exhibit C – Changes to A201 – General Conditions of the Contract for Construction.
 6. Exhibit D – HUD Subcontracting Plan (HSP).
 7. Vendor Conflict of Interest Disclosure.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

DRAFT AIA® Document A101® - 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month and year.)

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

«University Medical Center »« »
«602 Indiana Ave. »
«Lubbock, Texas 79415 »
« »

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

« »« »
« »
« »
« »

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

«UMC Operating Room #08 »
«602 Indiana Ave. »
«Lubbock, Texas 79415 »

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

«Parkhill »« »
«4222 85th St. »
«Lubbock, Texas 79423 »
« »

The Owner and Contractor agree as follows.

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

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

The parties should complete A101®-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

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

ARTICLE 2 THE WORK OF THIS CONTRACT

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

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

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

- [« »] The date of this Agreement.
- [«X»] A date set forth in a notice to proceed issued by the Owner.
- [« »] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)
- [« »]

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

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

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

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

[**« »**] By the following date: **« »**

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

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be **« »** (\$ **« »**), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

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

Item	Price

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

Item	Price	Conditions for Acceptance

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

Item	Price

§ 4.4 Unit prices, if any:

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

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

§ 4.5 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any.)

«Liquidated Damages in the amount of One Thousand Dollars (\$1,000) per day for each and every calendar day that the Work remains incomplete after the time stipulated shall be assessed.»

§ 4.6 Other:

(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

« »

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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

« »

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the « » day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the « » day of the « » month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than « » (« ») days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

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

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

§ 5.1.6 In accordance with AIA Document A201™-2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

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

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

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

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201-2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201-2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

«Five Percent (5%) »

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

« »

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

« »

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

« »

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

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

§ 5.2 Final Payment

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

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

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

« »

§ 5.3 Interest

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

(Insert rate of interest agreed upon, if any.)

«As required by Chapter 2251, Texas Government Code.»

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

«N/A »

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

Arbitration pursuant to Section 15.4 of AIA Document A201–2017

Litigation in a court of competent jurisdiction

Other *(Specify)*

« »

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

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

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

« »

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:

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

«Zach Sawyer »
«University Medical Center »
«PO Box 5980 »
«Lubbock, Texas 79415 »
«Email Address: Zach.Sawyer@umchealthsystem.com »
« »

§ 8.3 The Contractor’s representative:

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

« »
« »
« »
« »
« »
« »

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

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™-2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Intentionally omitted.

§ 8.7 Other provisions:

«None »

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™-2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™-2017, General Conditions of the Contract for Construction
- .4 Intentionally Omitted.

- .5 Drawings
See Exhibit 'B'

- .6 Specifications
See Exhibit 'C'

- .7 Addenda, if any:
See Exhibit []

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

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

[] AIA Document E204™-2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

« »

[] The Sustainability Plan:

Title	Date	Pages

[] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or

proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

« »

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

OWNER (Signature)

« »« »

(Printed name and title)

CONTRACTOR (Signature)

« »« »

(Printed name and title)



EXHIBIT A – INSURANCE AND BONDS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to [the applicable AIA Document A201™–2017](#), General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER’S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance required under this Article A.2.

§ A.2.2 Liability Insurance

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

§ A.2.3 Property Insurance

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

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

Cause of Loss	Sub-Limit
00000000000000000000	\$000000.00

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

(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit
00000000000000000000	\$000000.00

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

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

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

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner may purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, the Owner's usual property insurance, protecting the existing structure against direct physical loss or damage, not excluding the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm, and notwithstanding the undertaking of the Work. The insurance may also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. The Owner shall be responsible for all co-insurance penalties.

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

§ A.3.2 Contractor's Required Insurance Coverage

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

(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

N/A

§ A.3.2.2 Commercial General Liability

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

- .1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- .2 personal injury and advertising injury;
- .3 damages because of physical damage to, or destruction of, tangible property, including the loss of use of such property;
- .4 bodily injury or property damage arising out of completed operations;
- .5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions;
- .6 Personal injury, with Employment Exclusion Deleted (\$500,000.00); and
- .7 Fire Damage, any one fire (\$50,000.00).

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

- .1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- .2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- .3 Claims for bodily injury other than to employees of the insured.
- .4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured

- .5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- .6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- .7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- .8 Claims related to roofing, if the Work involves roofing.
- .9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- .10 Claims related to earth subsidence or movement
- .11 Claims related to explosion, collapse, and underground hazards, where the Work involves such hazards.

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

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

§ A.3.2.5 Workers' Compensation at statutory limits. [The requirement to maintain Workers' Compensation coverage shall apply to all Contractors, including private entities performing Work at the site and exempt from coverage on account of number of employees or occupation, which entities shall maintain voluntary compensation coverage at the same limits specified for mandatory coverage for the duration of the Project.](#)

[§ A.3.2.5.1 Required Workers' Compensation coverages, 28 TAC 110.110\(c\)\(7\), adopted to implement Texas Labor Code 406.096.](#)

[§ A.3.2.5.1.1 Workers' Compensation Insurance Coverages:](#)

[A. Definitions:](#)

[Certificate of coverage \("certificate"\)- A copy of a certificate of insurance, a certificate of authority to self-insure issued by the division, or a coverage agreement \(DWC Form-81, DWC Form-82, DWC Form-83, or DWC Form84\), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.](#)

[Duration of the project - includes the time from the beginning of the work on the project until the contractor's/person's work on the project has been completed and accepted by the governmental entity.](#)

Persons providing services on the project ("subcontractor" in §406.096) - includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

B. The contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the contractor providing services on the project, for the duration of the project.

C. The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

D. If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

E. The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

(1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

(2) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

F. The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

G. The contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.

H. The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Department of Insurance, Division of Workers' Compensation, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

I. The contractor shall contractually require each person with whom it contracts to provide services on a project, to:

(1) provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the project, for the duration of the project;

(2) provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project;

(3) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(4) obtain from each other person with whom it contracts, and provide to the contractor:

(a) a certificate of coverage, prior to the other person beginning work on the project; and

(b) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(7) contractually require each person with whom it contracts, to perform as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.

J. By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the division. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

K. The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the contract void if the contractor does not remedy the breach within ten days after receipt of notice of breach from the governmental entity.

§ A.3.2.6 Employers' Liability with policy limits not less than One Hundred Thousand Dollars and Zero Cents (\$100,000.00) each accident, One Hundred Thousand Dollars and Zero Cents (\$100,000.00) each employee, and Five Hundred Thousand Dollars and Zero Cents (\$500,000.00) policy limit. Coverage under this Section A.3.2.6 shall apply to claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees or persons or entities excluded by statute from the requirements of A.3.2.5 but required by the Contract Documents to provide the insurance required by that section.

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

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than 0000000000 (\$0000) per claim and 0000000000 (\$0000) in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than 0000000000 (\$0000) per claim and 0000000000 (\$0000) in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than 0000000000 (\$0000) per claim and 0000000000 (\$0000) in the aggregate.

§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than 0000000000 (\$0000) per claim and 0000000000 (\$0000) in the aggregate.

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than 0000000000 (\$0000) per claim and 0000000000 (\$0000) in the aggregate.

§ A.3.3 Contractor's Other Insurance Coverage

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

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

00000000000000000000000000000000

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

- § A.3.3.2.1 Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or

policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance

(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

The form of the policy for this coverage shall be Completed Value. If the Owner is damaged by the failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable costs properly attributable thereto. If this insurance is written on a Commercial General Liability policy form, the certificates shall be ACORD form 25-S, completed and supplemented in accordance with AIA Document G715TM-1991, Instruction Sheet and Supplemental Attachment for ACORD Certificate of Insurance 25-S.

- § A.3.3.2.2 Railroad Protective Liability Insurance**, with policy limits of not less than 0000000000 (\$0000) per claim 0000000000 (\$0000) in the aggregate, for Work within fifty (50) feet of railroad property.
- § A.3.3.2.3 Asbestos Abatement Liability Insurance**, with policy limits of not less than 0000000000 (\$0000) per claim and 0000000000 (\$0000) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.
- § A.3.3.2.4 Insurance for physical damage to property while it is in offsite storage and in transit to the construction site on an "all-risks" completed value form.**
- § A.3.3.2.5 Property insurance on an "all-risk" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.**
- § A.3.3.2.6 Other Insurance**
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits
<u>Owners' Liability, naming Owner, its employees, and the Architect as insureds</u>	<u>\$500.000/Occurrence & \$1,000,000.00</u>
<u>Aggregate</u>	

§ A.3.4 Performance Bond and Payment Bond

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

§ A.3.4.1 The Contractor shall furnish bonds covering faithful performance of the Work and payment of obligations arising thereunder in accordance with Chapter 2253 of the Texas Government Code. The Performance and Payment Bonds required by this Article may be in one or separate instruments in accordance with local law. Surety companies must be licensed to do business in the State of Texas. Bonds shall be obtained from a company listed on the current U.S. Treasury list of approved Sureties and Underwriters. All Performance and Payment Bonds provided by Contractor or any Subcontractor shall comply with the requirements of Section 3503.001-.005 of the Texas Insurance Code. The amount of each bond provided by Contractor shall be equal to One Hundred Percent (100%) of the Guaranteed Maximum Price. The Contractor shall require Performance and Payment Bonds to be provided by any Contractor for whom such bonds are required by Chapter 2253 of the Texas Government Code. The cost thereof shall be included in the Contract Sum.

§ A.3.4.2 The Contractor shall deliver the required bonds to the Owner not later than three days following the date of the Agreement is entered into, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

§ A.3.4.3 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

§ A.3.4.4 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

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

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

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

For sake of clarity, the Liability Insurance required under Section A.3.2.2 shall include all major divisions of coverage and be on a comprehensive basis, including: Premises Operations (including X, C, and U coverages, as applicable); Independent Contractors' Protective; Products and Completed Operations; Personal Injury Liability with Employment Exclusion deleted; Contractual Liability; Personal and Advertising Injury; Owner, non-owned, and hired motor vehicles; Broad Form Property Damage, including Completed Operations; Excess or Umbrella Liability.

If the General Liability coverages required under Section A.3.2.2 are provided by a Commercial General Liability Policy on a claims-made basis, the policy date or retroactive date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment, certified in accordance with Subparagraph 9.10.2 of the General Conditions.

All insurance coverages under this Exhibit A, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

Before an exposure to loss may occur, the Contractor shall file with the Owner a copy of each policy that includes insurance coverages required by Section A.3.3.2.1. Each policy shall contain all generally applicable conditions, definitions, exclusions, and endorsements related to this Project. Each policy shall contain a provision that the policy will not be cancelled or allowed to expire, and that its limits will not be reduced, until at least thirty (30) day's prior written notice has been given to the Owner.

EXHIBIT C

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

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

§ 1.1.2 THE CONTRACT

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

§ 1.1.3 THE WORK

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

§ 1.1.4 THE PROJECT

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

§ 1.1.5 THE DRAWINGS

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

§ 1.1.6 THE SPECIFICATIONS

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

§ 1.1.7 INSTRUMENTS OF SERVICE

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

§ 1.1.8 INITIAL DECISION MAKER

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

§ 1.1.9 THE PROJECT MANUAL

The Project Manual is a volume assembled for the Project that may include the bidding requirements, sample forms, Conditions of the Contract, and Specifications.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

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

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

§ 1.2.1.2 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

- .1 Modifications.
- .2 The Agreement.
- .3 Addenda, with those of later date having precedence over those of earlier date.
- .4 The Supplementary Conditions.
- .5 The General Conditions of the Contract for Construction.
- .6 Divisions 0 and 1 of the Specifications.
- .7 Drawings and Divisions 2–49 of the Specifications.
- .8 Other documents specifically enumerated in the Agreement as part of the Contract Documents
[review for each project].

In the case of conflicts or discrepancies between Drawings and Divisions 2–49 of the Specifications, or within or among the Contract Documents and not clarified by Addendum, the Architect will determine which takes precedence in accordance with Sections 4.2.11 and 4.2.12.

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

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

§ 1.2.4 The mention of certain items in the Specifications to the exclusion of others (whether in the general statement of the Work in a section or paragraph or in itemized lists of any nature); or the mention of work to be done in a specific area to the exclusion of similar or like work required in other areas; or the failure to properly cross-reference related work specified elsewhere, shall not relieve the Contractor of his responsibilities under the Contract Documents.

§ 1.2.5 The titles of sections and paragraphs are not necessarily fully descriptive of the work required thereby. The segregation of the various parts of the Work under headings, by trades, does not relieve the Contractor of the responsibility for furnishing every item shown on the drawings or specified in the specifications, or reasonably inferable therefrom as being necessary to produce the intended results, whether properly segregated or not.

§ 1.2.6 If an item is addressed differently in two places of the contract documents the greater quality or quantity applies and is assumed to take precedence.

§ 1.3 CAPITALIZATION

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

§ 1.4 INTERPRETATION

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

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

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

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

§ 1.6 NOTICE

§ 1.6.1 Where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by certified or registered mail, or by courier providing proof of delivery.

§ 1.6.2 [Intentionally omitted.](#)

§ 1.7 DIGITAL DATA USE AND TRANSMISSION

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

§ 1.8 BUILDING INFORMATION MODELS USE AND RELIANCE

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

ARTICLE 2 OWNER

§ 2.1 GENERAL

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

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

§ 2.2 EVIDENCE OF THE OWNER'S FINANCIAL ARRANGEMENTS

§ 2.2.1 [Intentionally omitted.](#)

§ 2.2.2 [Intentionally Omitted.](#)

§ 2.2.3 [Intentionally omitted.](#)

§ 2.2.4 [Intentionally omitted.](#)

§ 2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

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

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

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

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

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

§ 2.3.6 [The parties shall establish and agree upon necessary protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form.](#)

§ 2.4 OWNER'S RIGHT TO STOP THE WORK

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

§ 2.5 OWNER'S RIGHT TO CARRY OUT THE WORK

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

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

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

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

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the

Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

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

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

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

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

§ 3.2.5 The Contractor shall satisfy itself as to the accuracy of grades, elevations, dimensions, and locations. In cases of interconnection of Work with existing or other work, it shall verify at the site dimensions relating to such existing or other work.

§ 3.2.6 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for evaluating and responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information is available to the Contractor from a careful study and comparison of the Contract Documents, filed conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

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

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

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

§ 3.3.4 To the extent that any portion of the Work requires a trench excavation exceeding five (5) feet in depth, in accordance with Texas Health and Safety Code Section 756.023(a), Contractor shall fully comply, and shall require any applicable Subcontractor to comply, with:

- .1 The Occupational Safety and Health Administration standards for trench safety in effect for Construction of the Work;
- .2 The special shoring requirements, if any, of the Owner; and
- .3 Any geotechnical information obtained by Owner for use by the Contractor in the design of the trench safety system.
- .4 Trench excavation safety protection shall be a separate pay item and shall be based on linear feet of trench excavated. Special shoring requirements shall also be a separate pay item and shall be based on the square feet of shoring used.

§ 3.4 LABOR AND MATERIALS

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

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

§ 3.4.2.1 After the Contract has been executed, the Owner and Architect may consider requests for the substitution of products in place of those specified only under conditions set forth in the General Requirements (Division 1 of the Specifications). By making requests for substitutions, the Contractor:

- .1 Represents that it has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
- .2 Represents that it will provide the same warranty for the substitution as it would have provided for the product specified;

- .3 [Certifies that the cost data presented is complete and includes all related costs for the substituted product and of Work that must be changed as a result of the substitution, except for the Architect's redesign costs, and waives all claims for additional costs related to the substitution that subsequently become apparent; and](#)
- .4 [Shall coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be completed in all respects.](#)

[§ 3.4.2.2 The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for reviewing the Contractor's proposed substitutions and making agreed-upon changes in the Drawings and Specifications resulting from such substitutions.](#)

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them. [The Contractor shall not employ or subcontract with any persons \(including, but not limited to, the project superintendent\) or entity to which the Owner shall reasonably object.](#)

§ 3.5 WARRANTY

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

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

§ 3.6 TAXES

[§ 3.6.1 The Owner qualifies for exemption from State and Local Sales Taxes pursuant to the provisions of the Texas Limited sales Excise and Use Tax Act.](#)

[§ 3.6.2 The Contractor performing the Contract may purchase, rent, or lease all materials, supplies, and equipment used or consumed in the performance of this Contract by issuing to his suppliers an exemption certificate in lieu of the tax, said exemption certificate complying with State Comptroller of Public Accounts Ruling No. 95-0.07. Any such exemption certificate issued by the Contractor in lieu of the tax shall be subject to the provision of the State Comptroller of Public Accounts Ruling No. 95-0.09 as amended to be effective October 2, 1968.](#)

[§ 3.6.3 The Owner is an exempt entity under the tax laws of the State of Texas. Texas Tax Code §151.309; 34 TAC §3.322. The Owner represents that this Project is eligible for exemption from the State Sales Tax on tangible personal property and material incorporated in the Project, provided that the Contractor fulfills the requirements of the Texas Tax Code §151.311 and 43 TAC §3.291; 3.287. For the purpose of establishing exemption, it is understood and agreed that the Contractor may be required to segregate materials and labor costs at the time a Contract is awarded. Contractor will accept a Certificate of Exemption from the Owner, pursuant to Texas Tax Code §151.054\(e\); §151.154; 34 TAC §3.285. Failure of Contractor or any Subcontractor to obtain Certificates of Resale from their suppliers shall make the](#)

Contractor or Subcontractor responsible for absorbing the tax, without compensation from Owner. Contractor shall pay all necessary local, county, and state taxes, income tax, compensation tax, social security, and withholding payments as required by law.

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

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

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

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

§ 3.7.4 CONCEALED OR UNKNOWN CONDITIONS

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

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

§ 3.8 ALLOWANCES

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

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

§ 3.9 SUPERINTENDENT

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

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

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made a reasonable objection. The superintendent cannot be changed during the course of the project without written approval from the Owner unless the superintendent leaves the employ of the Contractor, in which case Section 3.9.2 shall apply.

§ 3.9.4 The Contractor shall provide an experienced full-time superintendent on the project. The superintendent shall be on the job site from 8:00 AM to 4:00 PM each workday for the duration of the Project. The Contractor agrees to pay the Owner \$600,00 per day, or portion of any day, that the superintendent is not on the job site, unless authorized in writing by the Owner. The Owner reserves the right to accept or reject the proposed superintendent based upon the individual's qualifications.

§ 3.10 CONTRACTOR 'S CONSTRUCTION AND SUBMITTAL SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor 's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work and Project in full cooperation with any other contractors who may be on the Project. The Contractor's schedule shall indicate the critical path necessary for the Work to be successfully completed within the Contract Time.

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

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

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

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

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

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

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

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

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

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

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

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

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

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

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

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

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

[§ 3.12.11 The Architect's review of Contractor's submittals will be limited to examination of an initial submittal and one \(1\) resubmittal. The Owner is entitled to obtain reimbursement from the Contractor for amounts paid to the Architect for evaluation of additional resubmittals.](#)

§ 3.13 USE OF SITE

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

§ 3.14 CUTTING AND PATCHING

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

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

§ 3.15 CLEANING UP

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

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

§ 3.16 ACCESS TO WORK

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

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

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

§ 3.18 INDEMNIFICATION

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

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

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

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

§ 4.1.2 [Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner.](#)

§ 4.2 ADMINISTRATION OF THE CONTRACT

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

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

§ 4.2.2.1 [The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for site visits made necessary by the fault of the Contractor or by defects and deficiencies in the Work.](#)

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

§ 4.2.4 COMMUNICATIONS

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

§ 4.2.5 [Based on the Architect's evaluations of the Contractor's Application for Payment, the Architect will review the amounts due to the Contractor and will consult with the Owner regarding such payments.](#)

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

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

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

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

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

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

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings.

§ 4.2.13 [Intentionally omitted.](#)

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

§ 4.2.14.1 Contractor's requests for information shall be prepared and submitted in accordance with Division 1 "General Requirements" sections on the form included in the Contract Documents, or, if not included, on AIA Document G716-2004. The Architect will return without action requests for information that do not conform to requirements of the Contract Documents.

§ 4.2.14.2 Where "as directed by Architect" or similar notation appears in the Contract Documents, the Contractor shall ask for and receive the necessary instructions from the Architect and Owner before proceeding with that portion of the Work. Requests for instructions shall be made with reasonable promptness.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

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

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

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

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

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

§ 5.2.2.1 If required by the Owner, the Contractor shall submit evidence that the persons or entities he proposes to use are competent, have had experience and have performed satisfactorily on jobs of similar size, complexity, type, and scope. The information, if required, shall give complete experience records of the proposed person(s) or entit(ies), which records shall include: name of job(s), type(s) of job, General Contractor(s), Architect(s), date(s) completed, and approximate cost of subcontract(s).

§ 5.2.2.2 The acceptance of a person or entity (including those who are to furnish materials or equipment fabricated to a special design) shall not constitute approval of the materials they customarily handle, unless the materials are acceptable to the Architect as being equal to those specified in quality, function, performance, and appearance. The Architect shall render a judgment as to acceptability of the materials.

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

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

§ 5.2.5 MANUFACTURERS AND FABRICATORS

§ 5.2.5.1 Not later than fourteen (14) days after the date of commencement of the Work, the Contractor shall furnish in writing to the Owner through the Architect the names of persons or entities proposed as manufacturers or fabricators for certain products, equipment, and systems identified in the General Requirements (Division 1 of the Specifications) and, where applicable, the name of the installing Subcontractor. The Architect may reply within fourteen (14) days to the Contractor in writing stating 1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or 2) that the Architect requires additional time to review. Failure of the Owner or Architect to reply within the fourteen (14) day period shall constitute notice of no reasonable objection.

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

§ 5.2.5.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has not reasonable objection. If the proposed but rejected manufacturer or fabricator was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute manufacturer's or fabricator's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as requires.

§ 5.2.5.4 The Contractor shall not substitute a person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

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

Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

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

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

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

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

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

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

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

§ 6.1.4 [Intentionally omitted.](#)

§ 6.2 MUTUAL RESPONSIBILITY

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

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

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

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

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

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the [Owner](#) will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

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

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

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

[§ 7.1.4 The combined markup for overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule:](#)

- .1 [For the Contractor, for Work performed by the Contractor's own forces \("self-performed work"\), ten percent \(10%\) of the cost. This limitation on markup for self-performed work](#)

will not apply to General Conditions/General Requirements scopes of work. This markup is intended only for scopes of work typically performed by a Trade Contractor such as Concrete/Drywall work. It is not intended to be applied to the Allowable General Conditions Line Items within the Divisions of Cost Elements (Exhibit) nor work performed for scopes such as general clean-up, material handling, field engineering, surveying, vertical transportation, etc. The self-performed work outside of the competitive process (general clean-up, material handling, field engineering, surveying, vertical transportation, etc.) shall be a direct cost-plus fee subject to a guaranteed maximum price or agreed-to percentage of the Construction Manager's guaranteed maximum price. The only mark-up allowed shall be based on the Construction Phase Fee percentage identified in the Agreement Between Owner and Construction Manager At-Risk.

- .2 For the Contractor, for Work performed by the Contractor's Subcontractors, five percent (5%) of the amount due the Subcontractors.
- .3 For each Subcontractor involved, for Work performed by that Subcontractor's own forces, ten percent (10%) of the cost.
- .4 For each Subcontractor involved, for Work performed by the Subcontractor's Sub-subcontractors, five percent (5%) of the amount due the Sub-subcontractor.
- .5 Contractor's mark-up should not exceed that indicated in AIA A133 Article 6.1.2 "The Construction Manager's Fee".
- .6 Direct and Indirect Costs Covered by Markup Percentages: As a further clarification, the agreed upon Markup Percentage Fee is intended to cover the Contractor's profit and all indirect costs associated with the change order work. Items intended to be covered by the Markup Percentage Fee include, but are not limited to: home office expenses, branch office and field office overhead expense of any kind; project management; superintendents, general foremen; non-working foremen, estimating, engineering; coordinating; expediting; purchasing; detailing; legal, accounting, data processing or other administrative expenses; shop drawings; permits; auto insurance and umbrella insurance; pick-up truck costs; and warranty expense costs. The cost for the use of small tools is also to be considered covered by the Markup Percentage Fee. Small tools shall be defined as tools and equipment (power or non-power) with an individual purchase cost of less than \$1,000.

§ 7.1.5 In cases where changes in the Work result in a credit to the Owner, the credit shall include direct costs for overhead, bonds, insurance, and profit. In cases where a change in the Work results in both credits and charges to the Owner, the Contractor will be allowed to add the overhead and profit percentages indicated in 7.1.4 to the net change.

§ 7.2 CHANGE ORDERS

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

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time. To permit evaluation, any request for a time extension must be justified and presented in adequate detail, showing the cause and how the proposed change will delay the final Substantial Completion date.

§ 7.2.2 In responding to a request for a proposed price for a change in the Work, or in submitting a claim, the Contractor shall furnish a lump sum proposal supported by a complete breakdown as described hereafter, indicating the estimated or actual cost of the Contractor for the performance of the changed Work, including the applicable percentage of overhead and profit described hereafter. Any request for a time extension must be justified and presented in adequate detail, showing that the proposed change will delay the final Contract Completion Date, to permit evaluation.

§ 7.2.2.1 Lump Sum Change Order Proposals: The Contractor will submit a properly itemized Lump Sum Change Order Proposal covering the additional work and/or the work to be deleted. This proposal will be itemized for the various components of work and segregated by labor, material, and equipment in a detailed format satisfactory to Owner. The Owner will require itemized change orders on all change order proposals from the Construction Manager, subcontractors, and sub-subcontractors regardless of tier. Details to be submitted will include detailed line-item estimates showing detailed materials quantity take-offs, material prices by item and related labor hour pricing information and extensions.

- .1 Labor: Estimated labor costs to be included for self-performed work shall be based on the actual cost per hour paid by the Contractor for those workers or crews of workers who the contractor reasonably anticipates will perform the change order work. Estimated labor hours shall include hours only for those workmen and working foremen directly involved in performing the change order work. Supervision above the level of working foremen (such as general foremen, non-working foremen, superintendent, project manager, etc.) is considered to be included in the Markup Percentages.
- .2 Labor Burden: Labor burden allowable in change orders shall be defined as employer's net actual cost of payroll taxes (FICA, Medicare, SUTA, FUTA), net actual cost for employer's cost of union benefits (or other usual and customary fringe benefits such as health insurance benefits, paid time off, retirement plan, etc., if the employees are not union employees). Contractor shall reduce their standard payroll tax percentages to properly reflect the effective cost reduction due to the estimated impact of the annual maximum wages subject to payroll taxes. Labor burdens shall be submitted, reviewed, and agreed to prior to any subcontractor starting work. Agreed to labor burdens will be used on all change orders.
- .3 Material: Estimated material change order costs shall reflect the Contractor's reasonably anticipated net actual cost for the purchase of the material needed for the change order work. Price quotations from material suppliers must be itemized with unit prices for each specific item to be purchased. "Lot pricing" quotations will not be considered sufficient substantiating detail.
- .4 Equipment: Allowable change order estimated costs may include appropriate amounts for rental of major equipment specifically needed to perform the change order work (defined as tools and equipment with an individual purchase cost of more than \$1,000). For contractor owned equipment, the "bare" equipment rental rates allowed to be used for pricing change order proposals shall be 90% of the monthly rate listed in the most current Equipment Watch publication of "Rental Rate Blue Book for Construction Mobilization Costs" by Randall Reilly, but no higher than the prevailing competitive rates for rental of similar equipment in the Project vicinity.
- .5 Deduct Change Orders and Net Deduct Changes: The application of the markup percentages referenced in the UGCs will apply to both additive and deductive change orders. In the case of a deductive change order, the credit will be computed by applying the sliding scale percentages so that a deductive change order would be computed in the same manner as an additive change order. In those instances where a change involves both additive and deductive work, the additions and deductions will be netted, and the markup percentage adjustments will be applied to the net amount.
- .6 Contingency: In no event will any lump sum or percentage amounts for "contingency" be allowed to be added as a separate line item in change order estimates. Unknowns attributable to labor hours will be accounted for when estimating labor hours anticipated to perform the work. Unknowns attributable to material scrap and waste will be estimated as part of material costs.

§ 7.2.2.2 To the amount of the adjustment of Subcontractor proposal(s) as listed under paragraph 7.2.2.1 above, the Contractor will be allowed to add a percentage to cover all overhead expenses and profit,

including supervision, small tools, insurance and bond. This percentage shall not exceed the combined allowable Subcontractor/Contractor percentage of ten percent (10%). It is expressly understood that when the Contractor performs the Work with its own forces there is no Subcontractor involved, the Contractor will be allowed a full maximum allowable markup of ten percent (10%).

§ 7.2.2.3 In cases where changes in the Work result in a credit to the Owner, the credit shall be limited to direct costs; that is, no overhead or profit shall be applied to such credit. In cases where a change in the Work results in both credits and charges to the Owner, the Contractor will be allowed to add the overhead and profit percentages in 7.2.2.1 and 7.2.2.2 to the net charge; if there is a net credit, no overhead or profit shall be charged.

§ 7.2.3 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials, and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are subcontracts, they shall be itemized also. In no case will a change be approved without such itemization.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

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

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

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

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

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

- .1 Costs of labor, applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

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

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

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

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

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

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

§ 7.4 MINOR CHANGES IN THE WORK

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

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

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

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

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

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

§ 8.2 PROGRESS AND COMPLETION

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

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

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

§ 8.3 DELAYS AND EXTENSIONS OF TIME

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

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

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

[§ 8.3.4 In the event of a delay in Contract Time, caused by the Owner, the Contractor will be reimbursed at a rate of \\$60.00 per hour for the time his superintendent is required to be on the job site.](#)

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

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

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, as required by the Architect [and Owner](#). This

schedule, unless objected to by the Architect or Owner, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect or Owner, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect and Owner an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents. The form of Application for Payment, duly notarized, shall be a current authorized edition of AIA Document G702™-1992, Application and Certificate for Payment, supported by a current authorized edition of AIA Document G703™-1992, Continuation Sheet.

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

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

§ 9.3.1.3 Until Substantial Completion, the Owner will pay ninety-five percent (95%) of the amount due the Contractor on account of progress payments.

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

§ 9.3.2.1 In preparing the Application for Payment, the Contractor shall verify the accuracy of the requests for payment submitted by his Subcontractors and materials suppliers and shall not include in his Application for Payment any sum that, in his opinion, if approved, will result in an overpayment for their work performed or materials delivered.

§ 9.3.2.2 All items that are shipped in crates or otherwise wrapped shall be uncrated or unwrapped and inspected by the Contractor upon arrival at the site. Materials shall be carefully inspected for quantities, sizes, and color, if color selection is a consideration, damaged, or defects; and if damaged, defective, or otherwise not in conformance with the Contract Documents, shall be recorded immediately.

§ 9.3.2.3 The Contractor shall not request payment for any items until he has inspected the items, and any materials that are not in conformance with the Contract Documents shall not be included in any Application for Payment.

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

§ 9.4 CERTIFICATES FOR PAYMENT

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

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

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

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

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probably filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;

- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

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

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

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

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment [for undisputed amounts](#), the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

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

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

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

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

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

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

Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

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

§ 9.7 FAILURE OF PAYMENT

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

§ 9.8 SUBSTANTIAL COMPLETION

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

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

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

[§ 9.8.3.1 The Architect will perform no more than two \(2\) inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections.](#)

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

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

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor.

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

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

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

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

[§ 9.10.1.1 The Architect will perform no more than two \(2\) inspections to determine whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections.](#)

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect [and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner,](#) (3) a written statement that the Contractor knows of no reason

that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.2.1 In compliance with laws of the State of Texas, it is distinctly understood that by virtue of this Contract, no mechanic, Contractor, material man, artisan, or laborer, whether skilled or unskilled, shall in any manner have, claim, or acquire any lien upon the house, building, or any of the improvements of whatever nature or kind so erected or to be erected under this Contract or upon any so erected, built, or situated.

§ 9.10.2.2 Although the above Article clearly states that no entity may place a lien on this building or property, the Owner requires releases and waivers of liens as required in other portions of this Contract.

§ 9.10.2.3 As a prerequisite to final payment, the Contractor shall submit the following items to the Architect, properly executed:

- .1 AIA Document G706 "Contractor's Affidavit of Payment of Debts and Claims".
- .2 AIA Document G706A "Contractor's Affidavit of Release of Liens", conditional upon receipt of final payment
- .3 AIA Document G707 "Consent of Surety Company to Final Payment", along with Contractor's release or waiver of lien (conditional upon receipt of final payment and separate releases or waivers of of liens from all Subcontractors and all material or equipment suppliers).
- .4 Written guarantee by Contractor and each Subcontractor that the Work will be free of defects in materials and workmanship for a period of one year from date of Substantial Completion, except as otherwise specified.
- .5 Maintenance Manuals as required in Specifications.

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

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

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or

.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

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

§ 9.11 TIME FOR COMPLETION AND LIQUIDATED DAMAGES

§ 9.11.1 It is hereby understood and mutually agreed, by and between the Contractor and Owner, that the date of the beginning and the time for completion of the Work are essential conditions of the Contract. The Contractor agrees that the Work will be prosecuted regularly and diligently at such rate of progress as will insure full completion thereof within the specified time as agreed upon and set forth in the Contract.

§ 9.11.2 If the Contractor shall neglect, fail, or refuse to complete the Work within the Contract Time specified, or any proper extension thereof granted by the Owner, then the Contractor and the Contractor's surety will be liable for and does hereby agree to pay to the Owner the sum of [REDACTED] Dollars (\$ [REDACTED].00), not as a penalty but as liquidated damages, for each and every calendar day that the Work remains incomplete after the time stipulated. The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the extreme difficulty in fixing and ascertaining the actual damages the Owner would sustain in such an event and said amount is agreed to be the amount of damages that the Owner would sustain.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

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

§ 10.2 SAFETY OF PERSONS AND PROPERTY

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

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

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

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

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

§ 10.2.4.1 When use or storage of explosives, or other hazardous materials, substances or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall give Owner no less than fourteen (14) days' advance notice.

§ 10.2.4.2 If the Contract Documents require the Contractor to handle materials or substances that under certain circumstances may be designated as hazardous, the Contractor shall handle such materials in an appropriate manner.

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

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

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

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

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

§ 10.2.9 Additional Penalty Payment

In the event of any incident negligent or intentional misconduct that creates the potential for or actually results in injury, Contractor agrees to pay, to the Owner, liquidated damages of \$10,000 in addition to any other damages for which Contractor would be liable by law or under this contract. § 10.3 HAZARDOUS MATERIALS

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

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe

containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact, [due to Owner's negligence or intentional misconduct](#), the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity. [The foregoing notwithstanding, Owner's obligation to indemnify shall apply only to the extent permitted by the Constitution and laws of the State of Texas, without waiving sovereign immunity, and not to exceed the limits provided by Texas Civil Practice & Remedies Code Chapters 101, 102, and 108.](#)

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

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

§ 10.3.6 If the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred [in instances other than those addressed in Subparagraph 10.3.5.](#)

§ 10.4 EMERGENCIES

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

[§ 10.5 AFFIDAVIT FOR ASBESTOS EXCLUSION AND NOTIFICATION](#)

[§ 10.5.1 Within Thirty \(30\) days of "Notice to Proceed," the Contractor will submit a notarized affidavit that states, "The undersigned Contractor certifies that to the best of his knowledge, information, and belief, the Work covered by the Contract Documents for his project will be completed without the use of any asbestos, asbestos related materials or equipment and that the Architect and Owner will be immediately notified if the Contractor or any of his assigns or Subcontractors uncovers or has belief that asbestos products or materials are being used, installed, or uncovered at the jobsite."](#)

§ 10.5.2 Upon completion of the Work, the Contractor will submit a notarized affidavit that states, “The undersigned Contractor certifies that to the best of his knowledge, information, and belief, the Work has been completed without the use of any asbestos related materials, fiber, or equipment.” In addition, the Contractor shall prepare a ring binder with indexed dividers for each specification section. Behind each divider the Contractor shall insert the MSDS for each product utilized in the construction of the project that is associated with this section.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 § 11.1 CONTRACTOR’S INSURANCE AND BONDS

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

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

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

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

§ 11.2 OWNER'S INSURANCE

§11.2.1 Intentionally omitted.

§ 11.2.2 Intentionally omitted.

§ 11.2.3 Intentionally omitted.

§ 11.3 WAIVERS OF SUBROGATION

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other; and (2) the Architect, Architect’s consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect,

Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

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

§ 11.4 LOSS OF USE, BUSINESS INTERRUPTION, AND DELAY IN COMPLETION INSURANCE
The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

§11.5 ADJUSTMENT AND SETTLEMENT OF INSURED LOSS

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

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

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

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

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

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE SUBSTANTIAL COMPLETION

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

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

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

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

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

§ 12.2.2.4 Just prior to termination of the one year warranty period, the Contractor shall accompany the Owner and Architect on an inspection tour of the building and shall note defects and shall start remedying these defects within ten (10) days of the inspection tour. For extended warranties or guarantees required by various sections, e.g., roofing, compressors, mechanical equipment, the Owner will notify the Contractor of deficiencies and Contractor shall start remedying these defects within seven (7) days of initial notification from the Owner. Contractor shall prosecute the Work without interruption until accepted by the Owner and the Architect even though such prosecution should extend beyond the limits of the warranty period.

§ 12.2.2.5 Upon request by the Owner and prior to the expiration of one year from the date of Substantial Completion, the Architect will conduct and the Contractor shall attend a meeting with the Owner to review the facility operations and performance.

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

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

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

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

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

§ 13.2 SUCCESSORS AND ASSIGNS

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

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

§ 13.3 RIGHTS AND REMEDIES

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

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

§ 13.4 TESTS AND INSPECTIONS

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

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

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

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

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

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

§ 13.5 INTEREST

[Payments and interest are due and payable in accordance with the Texas Prompt Pay Act, Texas Government Code Chapter 2251.](#)

[§ 13.7 EQUAL OPPORTUNITY IN EMPLOYMENT](#)

[§ 13.7.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, color, religion, sex \(including pregnancy\), national origin, age, physical or mental disability, genetic information, status as a protected veteran, or any other legally protected category, class, or characteristic. The Contractor agrees to post in conspicuous places, available to employees and applicants, notices setting forth the Contractor's nondiscrimination policies.](#)

[§ 13.7.2 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex \(including pregnancy\), national origin, age, physical or mental disability, genetic information, status as a protected veteran, or any other legally protected category, class, or characteristic.](#)

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

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

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped; or
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents.

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

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

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

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

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

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

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

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

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

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

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

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

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

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

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

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

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

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

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

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

§ 15.1.2 TIME LIMITS ON CLAIMS

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

§ 15.1.3 NOTICE OF CLAIMS

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 7 days after occurrence of the event giving rise to such Claim or within 7 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

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

§ 15.1.4 CONTINUING CONTRACT PERFORMANCE

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

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

§ 15.1.5 CLAIMS FOR ADDITIONAL COST

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

§ 15.1.6 CLAIMS FOR ADDITIONAL TIME

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

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the [critical path of construction as indicated on the Construction Schedule submitted and updated according to Section 3.10.1](#).

§ 15.1.6.3 Claims for increase in the Contract Time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work, and the number of days' increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.

§ 15.1.6.4 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.

§ 15.1.7 WAIVER OF CLAIMS FOR CONSEQUENTIAL DAMAGES

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

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

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

§ 15.2 INITIAL DECISION

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

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

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

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

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

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

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

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

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

§ 15.3 MEDIATION

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

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

§ 15.3.3 [Intentionally omitted.](#)

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

§ 15.4 [IMMUNITIES; ATTORNEYS' FEES](#)

§ 15.4.1 [Contractor stipulates that Owner is a political subdivision of the State of Texas, and, as such, enjoys immunities from suit and liability provided by the Constitution and laws of the State of Texas. By](#)

entering into this Agreement, Owner does not waive any of its immunities from suit and/or liability, except as otherwise specifically provided herein and as specifically authorized by law.

§ 15.4.1.1 Intentionally omitted.

§ 15.4.2 In any adjudication under this Agreement, reasonable and necessary attorneys' fees may be awarded to the prevailing party.

§ 15.4.3 Intentionally omitted.

§ 15.4.4 CONSOLIDATION OR JOINDER
Intentionally omitted.



HUB Subcontracting Plan (HSP) QUICK CHECKLIST

While this HSP Quick Checklist is being provided to merely assist you in readily identifying the sections of the HSP form that you will need to complete, it is very important that you adhere to the instructions in the HSP form and instructions provided by the contracting entity.

- ▶ **If you will be awarding all of the subcontracting work you have to offer under the contract to only Texas certified HUB vendors, complete:**
 - Section 1 - Respondent and Requisition Information
 - Section 2 a. - Yes, I will be subcontracting portions of the contract.
 - Section 2 b. - List all the portions of work you will subcontract, and indicate the percentage of the contract you expect to award to Texas certified HUB vendors.
 - Section 2 c. - Yes
 - Section 4 - Affirmation
 - GFE Method A (Attachment A) - Complete an Attachment A for each of the subcontracting opportunities you listed in Section 2 b.

- ▶ **If you will be subcontracting any portion of the contract to Texas certified HUB vendors and Non-HUB vendors, and the aggregate percentage of all the subcontracting work you will be awarding to the Texas certified HUB vendors with which you do not have a continuous contract* in place for more than five (5) years meets or exceeds the HUB Goal the contracting entity identified in the "Entity Special Instructions/Additional Requirements", complete:**
 - Section 1 - Respondent and Requisition Information
 - Section 2 a. - Yes, I will be subcontracting portions of the contract.
 - Section 2 b. - List all the portions of work you will subcontract, and indicate the percentage of the contract you expect to award to Texas certified HUB vendors and Non-HUB vendors.
 - Section 2 c. - No
 - Section 2 d. - Yes
 - Section 4 - Affirmation
 - GFE Method A (Attachment A) - Complete an Attachment A for each of the subcontracting opportunities you listed in Section 2 b.

- ▶ **If you will be subcontracting any portion of the contract to Texas certified HUB vendors and Non-HUB vendors or only to Non-HUB vendors, and the aggregate percentage of all the subcontracting work you will be awarding to the Texas certified HUB vendors with which you do not have a continuous contract* in place for more than five (5) years does not meet or exceed the HUB Goal the contracting entity identified in the "Entity Special Instructions/Additional Requirements", complete:**
 - Section 1 - Respondent and Requisition Information
 - Section 2 a. - Yes, I will be subcontracting portions of the contract.
 - Section 2 b. - List all the portions of work you will subcontract, and indicate the percentage of the contract you expect to award to Texas certified HUB vendors and Non-HUB vendors.
 - Section 2 c. - No
 - Section 2 d. - No
 - Section 4 - Affirmation
 - GFE Method B (Attachment B) - Complete an Attachment B for each of the subcontracting opportunities you listed in Section 2 b.

- ▶ **If you will not be subcontracting any portion of the contract and will be fulfilling the entire contract with your own resources (i.e., employees, supplies, materials and/or equipment), complete:**
 - Section 1 - Respondent and Requisition Information
 - Section 2 a. - No, I will not be subcontracting any portion of the contract, and I will be fulfilling the entire contract with my own resources.
 - Section 3 - Self Performing Justification
 - Section 4 - Affirmation

***Continuous Contract:** Any existing written agreement (including any renewals that are exercised) between a prime contractor and a HUB vendor, where the HUB vendor provides the prime contractor with goods or service, to include under the same contract for a specified period of time. The frequency the HUB vendor is utilized or paid during the term of the contract is not relevant to whether the contract is considered continuous. Two or more contracts that run concurrently or overlap one another for different periods of time are considered to be individual contracts rather than renewals or extensions to the original contract. In such situations the prime contractor and HUB vendor are entering (have entered) into "new" contracts.



HUB Subcontracting Plan (HSP)

In accordance with Texas Gov't Code §2161.252, the contracting entity has determined that subcontracting opportunities are probable under this contract. Therefore, all respondents, including State of Texas certified Historically Underutilized Businesses (HUBs) must complete and submit this State of Texas HUB Subcontracting Plan (HSP) with their response to the bid requisition (solicitation).

NOTE: Responses that do not include a completed HSP shall be rejected pursuant to Texas Gov't Code §2161.252(b).

The HUB Program promotes equal business opportunities for economically disadvantaged persons to contract with the Texas governmental entities in accordance with the goals specified in the 2009 State of Texas Disparity Study. The statewide HUB goals defined in 34 Texas Administrative Code (TAC) §20.284 are:

- **11.2 percent for heavy construction other than building contracts,**
- **21.1 percent for all building construction, including general contractors and operative builders' contracts,**
- **32.9 percent for all special trade construction contracts,**
- **23.7 percent for professional services contracts,**
- **26.0 percent for all other services contracts, and**
- **21.1 percent for commodities contracts.**

- - Entity Special Instructions/Additional Requirements - -

*In accordance with 34 TAC §20.285(d)(1)(D)(iii), a respondent (prime contractor) may demonstrate good faith effort to utilize Texas certified HUBs for its subcontracting opportunities if the total value of the respondent's subcontracts with Texas certified HUBs meets or exceeds the statewide HUB goal or the entity specific HUB goal, whichever is higher. When a respondent uses this method to demonstrate good faith effort, the respondent must identify the HUBs with which it will subcontract. If using existing contracts with Texas certified HUBs to satisfy this requirement, only the aggregate percentage of the contracts expected to be subcontracted to HUBs with which the respondent **does not** have a **continuous contract*** in place for **more than five (5) years** shall qualify for meeting the HUB goal. This limitation is designed to encourage vendor rotation as recommended by the 2009 Texas Disparity Study.*

SECTION 1: RESPONDENT AND REQUISITION INFORMATION

- a. Respondent (Company) Name: _____ State of Texas VID #: _____
 Point of Contact: _____ Phone #: _____
 E-mail Address: _____ Fax #: _____
- b. Is your company a State of Texas certified HUB? - Yes - No
- c. Requisition #: _____ Bid Open Date: _____
(mm/dd/yyyy)

SECTION 2: RESPONDENT'S SUBCONTRACTING INTENTIONS

After dividing the contract work into reasonable lots or portions to the extent consistent with prudent industry practices, and taking into consideration the scope of work to be performed under the proposed contract, including all potential subcontracting opportunities, the respondent must determine what portions of work, **including contracted staffing, goods and services will be subcontracted**. Note: In accordance with 34 TAC §20.282, a "Subcontractor" means a person who contracts with a prime contractor to work, to supply commodities, or to contribute toward completing work for a governmental entity.

a. Check the appropriate box (Yes or No) that identifies your subcontracting intentions:

- *Yes*, I will be subcontracting portions of the contract. (If *Yes*, complete Item b of this SECTION and continue to Item c of this SECTION.)
- *No*, I will not be subcontracting any portion of the contract, and I will be fulfilling the entire contract with my own resources, including employees, goods and services. (If *No*, continue to SECTION 3 and SECTION 4.)

b. List all the portions of work (subcontracting opportunities) you will subcontract. Also, based on the total value of the contract, identify the percentages of the contract you expect to award to Texas certified HUBs, and the percentage of the contract you expect to award to vendors that are not a Texas certified HUB (i.e., Non-HUB).

Item #	Subcontracting Opportunity Description	HUBs		Non-HUBs
		Percentage of the contract expected to be subcontracted to HUBs with which you do not have a continuous contract* in place for more than five (5) years .	Percentage of the contract expected to be subcontracted to HUBs with which you have a continuous contract* in place for more than five (5) years .	Percentage of the contract expected to be subcontracted to non-HUBs.
1		%	%	%
2		%	%	%
3		%	%	%
4		%	%	%
5		%	%	%
6		%	%	%
7		%	%	%
8		%	%	%
9		%	%	%
10		%	%	%
11		%	%	%
12		%	%	%
13		%	%	%
14		%	%	%
15		%	%	%
Aggregate percentages of the contract expected to be subcontracted:		%	%	%

(Note: If you have more than fifteen subcontracting opportunities, you may continue on the next page, which you may also photo-copy as necessary.)

c. Check the appropriate box (Yes or No) that indicates whether you will be using **only** Texas certified HUBs to perform **all** of the subcontracting opportunities you listed in SECTION 2, Item b.

- *Yes* (If *Yes*, continue to SECTION 4 and complete an "HSP Good Faith Effort - Method A (Attachment A)" for **each** of the subcontracting opportunities you listed.)
- *No* (If *No*, continue to Item d, of this SECTION.)

d. Check the appropriate box (Yes or No) that indicates whether the aggregate expected percentage of the contract you will subcontract **with Texas certified HUBs** with which you **do not** have a **continuous contract*** in place with for **more than five (5) years**, **meets or exceeds** the HUB goal the contracting entity identified on page 1 in the "Entity Special Instructions/Additional Requirements."

- *Yes* (If *Yes*, continue to SECTION 4 and complete an "HSP Good Faith Effort - Method A (Attachment A)" for **each** of the subcontracting opportunities you listed.)
- *No* (If *No*, continue to SECTION 4 and complete an "HSP Good Faith Effort - Method B (Attachment B)" for **each** of the subcontracting opportunities you listed.)

***Continuous Contract:** Any existing written agreement (including any renewals that are exercised) between a prime contractor and a HUB vendor, where the HUB vendor provides the prime contractor with goods or service under the same contract for a specified period of time. The frequency the HUB vendor is utilized or paid during the term of the contract is not relevant to whether the contract is considered continuous. Two or more contracts that run concurrently or overlap one another for different periods of time are considered to be individual contracts rather than renewals or extensions to the original contract. In such situations the prime contractor and HUB vendor are entering (have entered) into "new" contracts.

Enter your company's name here: _____

Requisition #: _____

SECTION 2: RESPONDENT'S SUBCONTRACTING INTENTIONS (CONTINUATION SHEET)

This page can be used as a continuation sheet to the HSP Form's page 2, Section 2, Item b. Continue listing the portions of work (subcontracting opportunities) you will subcontract. Also, based on the total value of the contract, identify the percentages of the contract you expect to award to Texas certified HUBs, and the percentage of the contract you expect to award to vendors that are not a Texas certified HUB (i.e., Non-HUB). You may photo-copy this page.

Item #	Subcontracting Opportunity Description	HUBs		Non-HUBs
		Percentage of the contract expected to be subcontracted to HUBs with which you do not have a continuous contract* in place for more than five (5) years .	Percentage of the contract expected to be subcontracted to HUBs with which you have a continuous contract* in place for more than five (5) years .	Percentage of the contract expected to be subcontracted to non-HUBs.
16		%	%	%
17		%	%	%
18		%	%	%
19		%	%	%
20		%	%	%
21		%	%	%
22		%	%	%
23		%	%	%
24		%	%	%
25		%	%	%
26		%	%	%
27		%	%	%
28		%	%	%
29		%	%	%
30		%	%	%
31		%	%	%
32		%	%	%
33		%	%	%
34		%	%	%
35		%	%	%
36		%	%	%
37		%	%	%
38		%	%	%
39		%	%	%
40		%	%	%
41		%	%	%
42		%	%	%
43		%	%	%
Aggregate percentages of the contract expected to be subcontracted:		%	%	%

***Continuous Contract:** Any existing written agreement (including any renewals that are exercised) between a prime contractor and a HUB vendor, where the HUB vendor provides the prime contractor with goods or service under the same contract for a specified period of time. The frequency the HUB vendor is utilized or paid during the term of the contract is not relevant to whether the contract is considered continuous. Two or more contracts that run concurrently or overlap one another for different periods of time are considered to be individual contracts rather than renewals or extensions to the original contract. In such situations the prime contractor and HUB vendor are entering (have entered) into "new" contracts.

Enter your company's name here: _____

Requisition #: _____

SECTION 3: SELF PERFORMING JUSTIFICATION (If you responded "No" to SECTION 2, Item a, you must complete this SECTION and continue to SECTION 4.) If you responded "No" to SECTION 2, Item a, in the space provided below **explain how** your company will perform the entire contract with its own employees, supplies, materials and/or equipment.

SECTION 4: AFFIRMATION

As evidenced by my signature below, I affirm that I am an authorized representative of the respondent listed in SECTION 1, and that the information and supporting documentation submitted with the HSP is true and correct. Respondent understands and agrees that, if awarded any portion of the requisition:

- The respondent will provide notice as soon as practical to all the subcontractors (HUBs and Non-HUBs) of their selection as a subcontractor for the awarded contract. The notice must specify at a minimum the contracting entity's name and its point of contact for the contract, the contract award number (as applicable), the subcontracting opportunity they (the subcontractor) will perform, the approximate dollar value of the subcontracting opportunity and the expected percentage of the total contract that the subcontracting opportunity represents. A copy of the notice required by this section must also be provided to the contracting entity's point of contact for the contract no later than ten (10) working days after the contract is awarded.

_____ Signature	_____ Printed Name	_____ Title	_____ Date (mm/dd/yyyy)
--------------------	-----------------------	----------------	-------------------------------

Reminder:

- If you responded "Yes" to SECTION 2, Items c or d, you must complete an "HSP Good Faith Effort - Method A (Attachment A)" for each of the subcontracting opportunities you listed in SECTION 2, Item b.
- If you responded "No" SECTION 2, Items c and d, you must complete an "HSP Good Faith Effort - Method B (Attachment B)" for each of the subcontracting opportunities you listed in SECTION 2, Item b.

HSP Good Faith Effort - Method B (Attachment B)

Enter your company's name here: _____ Requisition #: _____

IMPORTANT: If you responded “No” to **SECTION 2, Items c and d** of the completed HSP form, you must submit a completed “HSP Good Faith Effort - Method B (Attachment B)” for **each** of the subcontracting opportunities you listed in **SECTION 2, Item b** of the completed HSP form. You may photo-copy this page.

SECTION B-1: SUBCONTRACTING OPPORTUNITY

Enter the item number and description of the subcontracting opportunity you listed in SECTION 2, Item b, of the completed HSP form for which you are completing the attachment.

Item Number: _____ Description: _____

SECTION B-2: MENTOR PROTÉGÉ PROGRAM

If respondent is participating as a Mentor in a State of Texas Mentor Protégé Program, submitting its Protégé (Protégé must be a State of Texas certified HUB) as a subcontractor to perform the subcontracting opportunity listed in **SECTION B-1**, constitutes a good faith effort to subcontract with a Texas certified HUB towards that specific portion of work.

Check the appropriate box (Yes or No) that indicates whether you will be subcontracting the portion of work you listed in SECTION B-1 to your Protégé.

- Yes (If *Yes*, continue to SECTION B-4.)
- No / Not Applicable (If *No* or *Not Applicable*, continue to SECTION B-3 and SECTION B-4.)

SECTION B-3: NOTIFICATION OF SUBCONTRACTING OPPORTUNITY

When completing this section you **MUST** comply with items **a, b, c and d**, thereby demonstrating your Good Faith Effort of having notified Texas certified HUBs and trade organizations or development centers about the subcontracting opportunity you listed in SECTION B-1. Your notice should include the scope of work, information regarding the location to review plans and specifications, bonding and insurance requirements, required qualifications, and identify a contact person. When sending notice of your subcontracting opportunity, you are encouraged to use the attached HUB Subcontracting Opportunity Notice form.

Retain supporting documentation (i.e., certified letter, fax, e-mail) demonstrating evidence of your good faith effort to notify the Texas certified HUBs and trade organizations or development centers. Also, be mindful that a working day is considered a normal business day of a governmental entity, not including weekends, federal or state holidays, or days the entity is declared closed by its executive officer. The initial day the subcontracting opportunity notice is sent/provided to the HUBs and to the trade organizations or development centers is considered to be “day zero” and does not count as one of the seven (7) working days.

- a.** Provide written notification of the subcontracting opportunity you listed in SECTION B-1, to three (3) or more Texas certified HUBs. Unless the contracting entity specified a different time period, you must allow the HUBs at least seven (7) working days to respond to the notice prior to you submitting your bid response to the contracting entity. When searching for Texas certified HUBs and verifying their HUB status, ensure that you use the State of Texas’ Centralized Master Bidders List (CMBL) - Historically Underutilized Business (HUB) Directory Search located at <http://mycpa.cpa.state.tx.us/tpasscmlsearch/index.jsp>. HUB status code “A” signifies that the company is a Texas certified HUB.
- b.** List the **three (3) Texas certified HUBs** you notified regarding the subcontracting opportunity you listed in SECTION B-1. Include the company’s Texas Vendor Identification (VID) Number, the date you sent notice to that company, and indicate whether it was responsive or non-responsive to your subcontracting opportunity notice.

Company Name	Texas VID <small>(Do not enter Social Security Numbers.)</small>	Date Notice Sent <small>(mm/dd/yyyy)</small>	Did the HUB Respond?
			- Yes - No
			- Yes - No
			- Yes - No

- c.** Provide written notification of the subcontracting opportunity you listed in SECTION B-1 to **two (2)** or more trade organizations or development centers in Texas to assist in identifying potential HUBs by disseminating the subcontracting opportunity to their members/participants. Unless the contracting entity specified a different time period, you must provide your subcontracting opportunity notice to trade organizations or development centers at least seven (7) working days prior to submitting your bid response to the contracting entity. A list of trade organizations and development centers that have expressed an interest in receiving notices of subcontracting opportunities is available on the Statewide HUB Program’s webpage at <https://www.comptroller.texas.gov/purchasing/vendor/hub/resources.php>.
- d.** List **two (2) trade organizations or development centers** you notified regarding the subcontracting opportunity you listed in SECTION B-1. Include the date when you sent notice to it and indicate if it accepted or rejected your notice.

Trade Organizations or Development Centers	Date Notice Sent <small>(mm/dd/yyyy)</small>	Was the Notice Accepted?
		- Yes - No
		- Yes - No

HSP Good Faith Effort - Method B (Attachment B) Cont.

Enter your company's name here: _____ Requisition #: _____

SECTION B-4: SUBCONTRACTOR SELECTION

Enter the item number and description of the subcontracting opportunity you listed in **SECTION 2, Item b**, of the completed HSP form for which you are completing the attachment. You may photo-copy this page.

- a. Enter the item number and description of the subcontracting opportunity for which you are completing this Attachment B continuation page.

Item Number: Description:

- b. List the subcontractor(s) you selected to perform the subcontracting opportunity you listed in **SECTION B-1**. Also identify whether they are a Texas certified HUB and their Texas Vendor Identification (VID) Number or federal Employer Identification Number (EIN), the approximate dollar value of the work to be subcontracted, and the expected percentage of work to be subcontracted. When searching for Texas certified HUBs and verifying their HUB status, ensure that you use the State of Texas' Centralized Master Bidders List (CMBL) - Historically Underutilized Business (HUB) Directory Search located at <http://mycpa.cpa.state.tx.us/passcmbsearch/index.jsp>. HUB status code "A" signifies that the company is a Texas certified HUB.

Company Name	Texas certified HUB	Texas VID or federal EIN <small>Do not enter Social Security Numbers. If you do not know their VID / EIN, leave their VID / EIN field blank.</small>	Approximate Dollar Amount	Expected Percentage of Contract
	- Yes - No		\$	%
	- Yes - No		\$	%
	- Yes - No		\$	%
	- Yes - No		\$	%
	- Yes - No		\$	%
	- Yes - No		\$	%
	- Yes - No		\$	%
	- Yes - No		\$	%
	- Yes - No		\$	%
	- Yes - No		\$	%

- c. If any of the subcontractors you have selected to perform the subcontracting opportunity you listed in **SECTION B-1** is **not** a Texas certified HUB, provide written justification for your selection process (attach additional page if necessary):

REMINDER: As specified in SECTION 4 of the completed HSP form, if you (respondent) are awarded any portion of the requisition, you are required to provide notice as soon as practical to **all** the subcontractors (HUBs and Non-HUBs) of their selection as a subcontractor. The notice must specify at a minimum the contracting entity's name and its point of contact for the contract, the contract award number (as applicable), the subcontracting opportunity it (the subcontractor) will perform, the approximate dollar value of the subcontracting opportunity and the expected percentage of the total contract that the subcontracting opportunity represents. A copy of the notice required by this section must also be provided to the contracting entity's point of contact for the contract no later than ten (10) working days after the contract is awarded.

VENDOR CONFLICT OF INTEREST DISCLOSURE

**VENDOR QUESTIONNAIRE
Rev. 03/16/2018**

Beginning January 1, 2006, all persons and entities that contract or contemplate contracting with local governmental entities must complete a vendor questionnaire. The form requires the vendor to disclose the following:

- 1) Any business or other relationships with persons associated with the local government (UMC) who influence decisions over contracts;
- 2) Any business or other relationship with local government officers.

The questionnaire is attached, along with a list of UMC's local government officers.

UMC simply has to keep this on file and make it available if anyone asks. If any circumstances change, the vendor must file an updated questionnaire.

You have a contractual and legal obligation to update this form if applicable circumstances change.

GOVERNING BODY OF UMC HEALTH SYSTEM

President and Chief Executive Officer: Mark Funderburk

Board of Managers:

- Gladys Whitten, DMD
- John C. DeToledo, MD
- Gary Greenstreet
- Jason Medina
- Mont McClendon
- Mikella Newsom
- Laura Vinson
- Jolyn Wilkins

SECTION 00 73 43 – WAGE RATE REQUIREMENTS

PART 1 - GENERAL

1.1 WAGE RATE ESTABLISHMENT

- A. Pursuant to Chapter 2258, Texas Government Code, all contractors and any subcontractor involved in the construction of a public work project shall pay not less than the prevailing rates as per diem wages in the locality at the time of construction to all laborers, workmen and mechanics employed by them in the execution of this contract.
- B. The contractor shall forfeit as a penalty to the Owner, \$60.00 for each laborer, workman, or mechanic employed for each calendar day, or portion thereof, such laborer, workman, or mechanic is paid less than the said stipulated rates for any work done under this contract by him, or by any subcontractor under him.
- C. Nothing herein contained, however, shall be construed to prohibit the payment of more than the prevailing rate of wages to any laborer, workman, or mechanic employed on the Work.
- D. Attention is called to the fact that there must be paid on this Project not less than the general prevailing rates which have been established by the Owner, and verified by the Contractor as indicated in the Schedule at the end of this document.
- E. The General Prevailing Rate for overtime shall be 1-1/2 times the scheduled rate on an hourly basis.

1.2 POSTING WAGE RATES

- A. Minimum Wage Rates shall be posted on job site in a conspicuous place open for inspection by all workmen.

1.3 EMPLOYEE CLAIMS

- A. Any employee who alleges that he has not been paid the minimum wage rate may file a written claim with the Owner.

1.4 PAYMENT OF EMPLOYEES AND PAYROLL RECORDS

- A. The Contractor and each subcontractor shall pay each of his employees engaged to perform Work under this contract in full (less mandatory legal deductions) not less than once a week.
- B. Payment is to be in cash or check readily payable without discount. If payment is by cash, obtain the signature of the employee verifying the payroll period, total hours worked, rate per hour, total wages earned and the date received.
- C. Attach 1 copy of cash payment verification to payroll records.
- D. The Contractor and each subcontractor engaged at the site of the Work shall prepare and maintain weekly payroll reports certified to be correct.
- E. Payroll records shall contain the name, social security number, classification, rate per hour, hours worked each day, including regular hours and overtime hours.

1.5 PAYROLL RECORDS

- A. Payroll records shall be made available upon request for inspection by the Architect or by a designated representative of the Owner to ascertain compliance with the minimum wage scale provision of this contract.

1.6 WAGE RATE SCHEDULE

- A. See attached UMC Prevailing Wage Rates for Construction Projects, issued by University Medical Center, dated November 2020.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

ATTACHMENT "A"
PREVAILING WAGE DETERMINATION
LUBBOCK COUNTY

DATE: NOVEMBER 2020
CONSTRUCTION TYPE: BUILDING
AREA: LUBBOCK COUNTY

BUILDING CONSTRUCTION TRADE CLASSIFICATION	PREVAILING WAGE RATE
Asbestos worker	14.50
Carpenter	21.65
Carpet/Floor Installer	16.46
Concrete Finisher	18.85
Datacomm/Telecom	15.50
Drywall Installer	19.00
Ceiling Installer	17.68
Electrician - Journeyman	24.05
Electrician - Apprentice	16.96
Elevator Mechanic	34.88
Glazier	17.00
Heavy Equipment Operator	20.00
Piping/Ductwork Insulator	17.00
Iron/Structural Worker	23.00
Laborer	14.00
Lather/Plasterer	20.56
Light Equipment Operator	18.80
Mason/Bricklayer	23.95
Painter	15.00
Plumber/Pipefitter Journeyman	24.40
Plumber Apprentice	15.00
Roofer	16.00
Sheetmetal	22.73
Sprinkler Fitter	21.50
Terrazzo Worker	20.00
Tile Setter	16.00
Waterproofers	15.72

Unlisted classifications needed for work not included within the scope of the classifications listed may not be added after award. The job classifications are not inclusive of all possible trades on a construction project.

It is the responsibility of the contractor to classify the worker in accordance with the published classifications and demonstrate that workers are paid commensurate with determined rates.

END OF SECTION

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Work covered by contract documents.
 - 2. Project information.
 - 3. Owner-furnished products.
 - 4. Access to site.
 - 5. Specification and Drawing conventions.
 - 6. Miscellaneous provisions.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Identification: General infrastructure upgrades to systems located in the OR-8/Hybrid Operating Room.
- B. Location: 602 Indiana Avenue.
- C. Verbal Summary: Without force or effect on requirements of the Contract Documents, a brief description follows:
 - 1. General infrastructure upgrades to systems located in the OR-8/Hybrid Operating Room, primarily in the Basement, on the Roof, and indicated locations throughout the building.

1.3 PROJECT INFORMATION

- A. Project Identification: University Medical Center – OR-8/Hybrid Operating Room.
- B. Owner:
 - 1. Owner's Representative for Construction: Zach Sawyer, UMC Construction Services; 806.548.0146.
- C. Architect:
 - 1. Architect's Representative for Construction: Richard Lundstrom, Parkhill, 806.473.2200 (office); 806.473.3688 (direct).

1.4 OWNER-FURNISHED PRODUCTS

- A. Owner-Furnished, Owner-Installed (OFOI) Products:
 - 1. Owner will furnish and install (by separate contractor/installer/vendor) products indicated.
 - 2. Owner's Responsibilities:
 - a. Arrange for and review Shop Drawings, products data, and samples to purchase and deliver OFOI products to the site.
 - b. Coordinate in advance with the Contractor for delivery or OFOI products.
 - c. Delivery will be timely for installation; Contractor will not be responsible to store or protect OFOI products unless authorized by Owner.
 - d. Owner is responsible for coordinating installation of OFOI products with Contractor's schedule and use of site.

3. Contractor's Responsibilities:
 - a. Owner will notify Contractor of delivery of all OFOI items.
 - b. Facilitate access to area of installation with Owner's installer.
- B. Owner-Furnished, Contractor-Installed (OFICI) Products:
 1. Owner will furnish products for Contractor installation. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products and making building services connections.
 2. Owner's Responsibilities:
 - a. Arrange for and deliver Owner reviewed Shop Drawings, product data, and samples, to Contractor.
 - b. Arrange and pay for product delivery to site.
 - c. On delivery, inspect products jointly with Contractor.
 - d. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - e. Arrange for manufacturers' warranties, inspections, and service.
 3. Contractor's Responsibilities:
 - a. Review Owner reviewed Shop Drawings, product data, and samples.
 - b. Receive and unload products at site; inspect for completeness or damage, jointly with Owner.
 - c. Handle, store, and install products.
 - d. Repair or replace items damaged after receipt.

1.5 ACCESS TO SITE

- A. General: Owner will continue to utilize parts of the Basement during construction. Contractor must coordinate their access/all activities with Owner IN ADVANCE.
- B. Use of Site: Limit use of Project site to areas within the Contract limit indicated. Do not disturb portions of Project site beyond areas where Work is indicated.
 1. Limits: confine construction operations to immediate Work area.
 2. Driveways, Walkways, and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or material storage.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment onsite.
 - c. UMC will expect all onsite workers to comply with current CMS Guidelines at the time of entering the facility.

1.6 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations.
 1. Maintain access to walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities with jurisdiction.
 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
 - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
 - 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
 - 3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
 - 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.7 WORK RESTRICTIONS

- A. Work Restrictions, General: comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
 - 2. Generally, all construction activities will be adjacent to, within, above occupied patient areas. Refer to Section on Phasing and section on Environmental Controls.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than 5 days in advance of proposed utility interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility interruptions.
- C. Noise, vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
- D. Notify Owner not less than 2 days in advance of proposed disruptive operations.
 - 1. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Nonsmoking building: Smoking not permitted within the building or with 25 feet of entrances, operable windows, or outdoor-air intakes.
- F. Restricted Substances: Use of tobacco products and other controlled substances within the existing building and on Project site is not permitted.
- G. Employee Identification: Owner will provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- H. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
 - 1. Maintain list of approved screened personnel with Owner's representative.

1.8 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 60 00 "Product Requirements:" Requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

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

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit 3 copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

- i. Cost information, including a proposal of change, if any, in the Contract Sum.
 - j. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - k. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

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

1.5 PROCEDURES

- A. Coordination: Revise or adjust affected Work as necessary to integrate Work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.

- h. If requested substitution involves more than 1 contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed unless otherwise indicated.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 25 00 "Substitution Procedures:" Administrative procedures for handling requests for substitutions made after the Contract award.

1.2 MINOR CHANGES IN THE WORK

- A. Architect will issue through Contractor supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on Parkhill Standard Supplemental Information Form.

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop Work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms acceptable to Architect.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 01 25 00 "Substitution Procedures," if the proposed change requires substitution of 1 product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Architect.

1.4 CHANGE ORDER PROCEDURES

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

1.5 CONSTRUCTION CHANGE DIRECTIVE

- A. Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of Work required by the Construction Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - Other Division 01 Specification Sections apply to Work of this Section.
 - 1. Section 01 26 00 "Contract Modification Procedures:" Administrative procedures for handling changes to the Contract.

1.2 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than 7 days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least 1 line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Arrange schedule of values consistent with format of AIA Document G703.
 - 3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of 5 percent of the Contract Sum.
 - 4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 - 5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

6. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
7. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
8. Schedule of Values Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Application for Payment Forms: Use forms acceptable to Architect and Owner for Applications for Payment. Submit forms for approval with initial submittal of schedule of values.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for Work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for Work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for Work being carried out under Owner-requested Project acceleration.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored onsite and items stored off site.
 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

- F. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 - 1. List of subcontractors.
 - 2. Schedule of values.
 - 3. Contractor's construction schedule (preliminary if not final). Must be both printed format and MS Project electronic file format.
 - 4. Products list (preliminary if not final).
 - 5. Submittal schedule (preliminary if not final).
 - 6. List of Contractor's staff assignments.
 - 7. List of Contractor's principal consultants.
 - 8. Copies of building permits.
 - 9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 - 10. Initial progress report.
 - 11. Report of preconstruction conference.
 - 12. Certificates of insurance and insurance policies.
 - 13. Performance and payment bonds.
 - 14. Data needed to acquire Owner's insurance.
- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
 - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 - 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
 - 1. Evidence of completion of Project closeout requirements.
 - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 - 3. Updated final statement, accounting for final changes to the Contract Sum.
 - 4. AIA Document G706 - Contractor's Affidavit of Payment of Debts and Claims.
 - 5. AIA Document G706A - Contractor's Affidavit of Release of Liens.
 - 6. AIA Document G707 - Consent of Surety to Final Payment.
 - 7. Evidence that claims have been settled.
 - 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 - 9. Final liquidated damages settlement statement.

1.5 PROJECT SCHEDULE

- A. UMC uses MS Project to manage all Capital Expenditure projects from inception through occupancy.
- B. With each application for payment, Contractor will transmit to Owner an electronic file of the current Project schedule in MS Project format.
- C. Owner will use the file to update their Master Project Schedule.
- D. Owner does not want to see Project detail, but does not expect any other loaded info (such as staffing, cost, etc.).
- E. Submit with initial Application for Payment and coordinate the file format and content with Owner.
- F. Contractor will be expected to submit a current Project schedule digital file (MS Project format) with each Application for Payment.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Project Information Management.
 - 2. Coordination.
 - 3. Electronic Drawing file (digital data) request.
 - 4. Submittal schedule.
 - 5. Preconstruction meeting.
 - 6. Request for information.
 - 7. Site mobilization meeting.
 - 8. Progress meetings.
 - 9. Preinstallation meetings.
 - 10. Cutting and patching.
 - 11. Alteration Project procedures.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 PROJECT INFORMATION MANAGEMENT

- A. Project Website:
 - 1. Use Newforma Info Exchange; <https://projects.team-psc.com/UserWeb/Login> to send and receive Project information.
 - 2. Contact Architect to set name and password information.
 - 3. If this Project is not listed when logged in, contact Architect to add this Project to your account.
- B. Project information includes, but is not limited to, the following:
 - 1. Product Submittals.
 - 2. Requests for Information (RFI).
 - 3. Applications for Payment.
 - 4. Schedules.
 - 5. Construction Change Requests (CCRs).
 - 6. Closeout Documents.
 - 7. Construction Document Files.
 - a. Weather Days.
 - b. Electronic File Requests.
 - c. Correspondence.
 - d. Test Reports.
 - e. Meeting Minutes.
 - f. Field Reports.

1.3 COORDINATION

- A. Coordinate scheduling, submittals, and Work to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.
- B. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical Work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Large Apparatus: Any large apparatus which is to be installed in any space and is too large to permit access through windows, doorways, or shafts shall be provided before enclosing structure is completed.
- F. Items which require electrical connections shall be coordinated with Division 26 Electrical for:
 - 1. Voltage.
 - 2. Phase.
 - 3. Ampacity.
 - 4. Number and size of wires.
 - 5. Wiring diagrams.
 - 6. Starter size, details, and location.
 - 7. Control devices and details.
- G. Coordinate completion and clean-up of Work of separate Sections in preparation for Substantial Completion and for portions of Work designated for Owner's occupancy.
- H. After Owner occupancy of premises, coordinate access to site with Owner for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.4 ELECTRONIC DRAWING FILE (DIGITAL DATA) REQUEST

- A. During Procurement Phase:
 - 1. Bidders and Proposers may purchase a Digital Data file. Digital Data file will be provided in software release currently used by Architect. File will be provided via Architect's Project website.
 - 2. AutoCAD Drawing files (.dwg) are available for purchase from Architect upon request. Cost of files are indicated below plus applicable tax.
 - a. 1 - 3 Sheets: \$100.00 flat fee.
 - b. 4 - 6 Sheets: \$400.00 flat fee.
 - c. 7 - 9 Sheets: \$500.00 flat fee.
 - 3. Revit® BIM Model files (.rvt) are available for purchase from Architect upon request. Cost of model files are \$150.00 for each model plus applicable tax. All details, detail annotation, and references are omitted and not part of the Model file.
 - 4. Prior to delivery of file(s), purchaser shall sign a Digital Data Licensing Agreement. Payment for Digital Data file(s) shall occur upon delivery of file to purchaser.
 - 5. Digital Data file(s) shall be used only for preparing Bids and Proposals required by this Project and shall not be used in any other form, in whole or in part.

- B. Upon Award of Contract:
1. At the pre-construction meeting, Contractor shall bring the executed Digital Data Licensing Agreement (AIA C106-2013) at the end of this Section for the release of electronic files. Upon Contractor submitting the executed Agreement to the Architect, the Architect will provide the Contractor 1 electronic copy of the Revit®BIM Model file(s), AutoCAD (.dwg) file(s), when Revit®BIM Model file is not available, and Portable Document Format (.pdf) file(s) **at no charge** within 5 working days. **Note that CAD files associated with the work can be accessed and exported from the Revit®BIM Model provided to the Contractor through the use of Revit®software; therefore, individual CAD files will not be provided by the Architect.** Files and Formats to be as follows:
 - a. Structural: Revit®BIM Model and associated working Plan views.
 - 1) Overall Site Plan with utility and grading information.
 - 2) All details, detail annotation and references are omitted and not part of the AutoCAD file.
 - b. Architectural/Interior: Revit®BIM Model and associated working Plan views.
 - 1) Plan views contain overall and enlarged section Plan view set-up of floor Plan, floor patterns, reflected ceiling and roof Plans only. All Plan views contain grids, dimensions, room names, and general annotation.
 - 2) Reflected Ceiling Plans contain ceiling grids and types only. Lighting and Mechanical are provided as part of the MEP Model.
 - 3) Roof Plans contain grids and general annotation only. Mechanical is provided as part of the MEP Model.
 - 4) Interior and exterior elevations and schedules.
 - 5) Finish plans and finish schedules.
 - 6) All details, detail annotation and references are omitted and not part of the model file.
 - c. Mechanical, Electrical, and Plumbing: Revit®BIM Model and associated working Plan views.
 - 1) Plan views contain overall and enlarged Plan section view set-up of mechanical, electrical lighting, electrical power, and plumbing plans only.
 - 2) All details, detail annotation and references are omitted and not part of the model file.
 - d. Other Disciplines: Revit®BIM Model and associated working Plan views.
 - 1) Plan views contain overall and enlarged Plan section view set-up showing all device locations and general annotation.
 - 2) All details, detail annotation and references are omitted and not part of the model file.
 2. The Revit®BIM Model file provided to the Contractor is NOT FOR CONSTRUCTION PURPOSES, but for convenience only. This BIM Model will consist of the original model utilized for base bid. It is the responsibility of the Contractor to coordinate all accepted alternates, addenda, Request for Information, Proposal Requests, and any other changes realized during the procurement and construction phases. The Primary Designer will not provide up-to-date Contract Documents or updated BIM Models to the Contractor unless otherwise stated within the Owner/Architect Agreement.

3. Conformed Construction Documents: If Conformed Construction Documents are required by the Owner/Architect Agreement, they will be provided in PDF. Conformed Construction Documents are the Drawings and Specifications modified to include any Addenda issued before execution of the Contract.
 - a. To the extent Conformed Construction Documents are provided to the Contractor, the following provisions shall apply:
 - 1) The Conformed Construction Documents and related information contained therein, are provided for Contractor's convenience only, and does not relieve the Contractor from the requirements of the Contract Documents. Specifically, to the extent that any discrepancy or conflict exists between the Issue for Bid documents, including any Addenda issued prior to execution of the Contract or Modifications issued after the execution of the Contract on the 1 hand, and the Conformed Construction Documents on the other; the Issue for Bid documents, Addenda, and Modifications shall control unless otherwise specified in writing by the Architect.
 - 2) Contractor shall not use such Drawings, documents, or other data, in whole or in part, for any purpose or project other than this Project in the preparation of Shop Drawings and other submittals.
 - 3) Contractor acknowledges that such Drawings, documents, and other data are subject to change or modification. Contractor shall be responsible for updating any Drawings, documents, or other data obtained prior to use by them for any purpose.
 - 4) Any Conformed Construction Documents, including any Drawings, Specifications, documents, or other data related thereto are provided "as is" without representation or warranty by Architect, either expressed or implied.
 - 5) Contractor acknowledges that Conformed Construction Documents provided by Architect are as a courtesy to Contractor, at their specific request, and accordingly, CONTRACTOR HEREBY AGREES TO RELEASE, HOLD HARMLESS, DEFEND AND INDEMNIFY ARCHITECT AND OWNER FROM ANY AND ALL CLAIMS, DEMANDS, OR CAUSES OF ACTION, WHICH CONTRACTOR OR ANY THIRD PARTY MAY HAVE BY REASON OF ANY INJURY OR DAMAGE SUSTAINED BY CONTRACTOR OR THIRD PARTY ARISING OUT OF OR IN ANY WAY RELATED TO THE USE OF SUCH CONFORMED CONSTRUCTION DOCUMENTS.

1.5 SUBMITTAL SCHEDULE

- A. Prepare submittal schedule in accordance with General Conditions of the Contract for Construction.
- B. Include in submittal schedule all submittals and samples required by all section of this Project Manual and any additional submittals required by the Contractor to construct the Project.
- C. Submit submittal schedule for Architect's review within 15 days after date established in Notice to Proceed or with the first Application for Payment, whichever is sooner. Failure to submit submittal schedule with the first Application for Payment will be cause for not processing Application for Payment.

1.6 PRECONSTRUCTION MEETING

- A. Owner will schedule a meeting after Notice to Proceed.
- B. Attendance Required:
 - 1. Owner.
 - 2. Architect.
 - 3. Contractor.
 - 4. Major subcontractors.
- C. Agenda:
 - 1. Submission of executed bonds and insurance certificates.
 - 2. Distribution of Contract Documents.
 - 3. Submission of list of subcontractors, list of products, Schedule of Values, submittal schedule, and progress schedule.
 - 4. Designation of personnel representing each party in Contract and Architect.
 - 5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, Request for Information (RFI), and Contract closeout procedures.
 - 6. Review Notice to Proceed (NTP) and Substantial Completion Dates.
 - 7. Workers' Identification and Background Checks.
 - 8. Surface drainage requirements (SWPPP).
 - 9. Scheduling:
 - a. Use of premises by Owner and Contractor.
 - b. Owner's requirements and partial occupancy by phase.
 - c. Construction facilities and controls provided by Owner.
 - d. Temporary utilities provided by Owner.
 - e. Survey and building layout.
 - f. Security and housekeeping procedures.
 - g. Construction progress meetings.
 - h. Procedures for testing.
 - i. Procedures for maintaining record documents.
 - j. Requirements for start-up of equipment.
 - k. Inspection and acceptance of equipment put into service during construction period.
 - 10. Scheduling activities of Construction Material Testing (CMT) lab.
- D. Record minutes and distribute copies within 3 days after meeting to participants with 2 copies to Architect and those affected by decisions made.

1.7 REQUEST FOR INFORMATION

- A. Request for information (RFI) requests from subcontractors or material suppliers will not be considered. All RFI's must be submitted by Contractor.
- B. RFI's must be submitted on AIA Document G716, or equal approved by Architect in advance of submitting first RFI. A copy of Document G716 may be obtained from Architect upon request by Contractor.
- C. Information indicated on RFI shall be complete before submission. If Architect determines that request can be answered with information provided, Architect will assign an RFI tracking number. Requests determined by Architect not to be an RFI will be returned to Contractor electronically and deleted from Architect's electronic tracking software without being assigned an RFI tracking number. A transmittal document returning the denied RFI request will be provided with a response indicating action to be taken by Contractor.

- D. Only 1 item shall be addressed on each RFI request. RFIs may state if multiple RFIs are related.
- E. Allow 7 days for Architect's response to each RFI.
- F. Response to RFI will be issued to Contractor and Owner per Section 01 33 00 "Submittal Procedures."
- G. Also refer to Section 01 31 00 "Project Management and Coordination" for additional instructions on RFIs.

1.8 SITE MOBILIZATION MEETING

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

1.9 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of Work at minimum bi-monthly or weekly intervals as requested by Owner's representative.
- B. Make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.
- C. Attendance Required:
 - 1. Owner.
 - 2. Job superintendent.
 - 3. Major subcontractors.
 - 4. Suppliers.
 - 5. Architect as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems which impede planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding Work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.

12. Effect of proposed changes on progress schedule and coordination.
 13. Other business relating to Work.
- E. Record minutes, and distribute copies within 3 days to Architect, participants, and those affected by decisions made.
- F. Owner, Architect, Contractor Progress Meetings (OAC):
1. Bi-weekly or weekly, as requested by Owner or Architect.
 2. Purpose to review site progress, status of all submittals, and resolution of outstanding issues.

1.10 PREINSTALLATION MEETING

- A. When required in individual Specification Sections, convene a preinstallation meeting at site prior to installing Work.
- B. Require attendance of parties directly affecting, or affected by, Work.
- C. Notify Architect 4 days in advance of meeting date.
- D. Prepare agenda and preside at meeting.
1. Review conditions of installation, preparation, and installation procedures.
 2. Review coordination with related Work.
- E. Record minutes and distribute copies within 3 days after meeting to participants, with 3 copies to Architect.

PART 2 - PRODUCTS

2.1 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Motors: Specific motor type is specified in individual Specification Sections.
- B. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
- C. Cord and Plug: Provide minimum 6-foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual Specification Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual Specification Sections.
- D. Verify that utility services are available, of correct characteristics, and in correct location.

3.2 PREPARATION

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

3.3 CUTTING AND PATCHING

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Submit request in advance of cutting or altering elements which affects:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching to complete Work, and to:
 - 1. Fit several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and non-conforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute Work by methods which will avoid damage to other Work, and provide proper surfaces to receive patching and finishing.
- E. Cut rigid materials using masonry saw or core drill.
- F. Restore Work with new products in accordance with requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection. For an assembly, refinish entire unit.
- J. Identify any hazardous substance or condition exposed during Work to Architect for decision or remedy.

3.4 ALTERATION PROJECT PROCEDURES

- A. Materials: As specified in product Sections; match existing products and Work for patching and extending Work.
- B. Employ skilled and experienced installer to perform cutting and patching.
- C. Close openings in exterior surfaces to protect existing Work from weather and extremes of temperature and humidity.
- D. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition unless otherwise specified.
- E. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
- F. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patched Work to match existing adjacent Work in texture and appearance.
- G. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to Architect for review.
- H. Where a change of plane of 1/4-inch or more occurs, submit recommendation for providing a smooth transition for Architect review.
- I. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- J. Finish surfaces as specified in individual product Sections.

END OF SECTION

AIA[®] Document C106™ – 2022

Digital Data Licensing Agreement

AGREEMENT made as of the day of in the year
(In words, indicate day, month, and year.)

BETWEEN the Party transmitting Digital Data ("Transmitting Party"):
(Name, address, and contact information, including electronic addresses)

and the Party receiving the Digital Data ("Receiving Party"):
(Name, address, and contact information, including electronic addresses)

for the following Project:
(Name and location or address of the Project)

for the following Digital Data ("Digital Data"):
(Identify below, in detail, the information created or stored in digital form that the Parties intend to be subject to this Agreement.)

[Revit Models (.rvt files)]
[AutoCAD (.dwg files)]
[Portable Document Format (.pdf)]

The Transmitting Party and Receiving Party agree as follows.

ADDITIONS AND DELETIONS:

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

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

TABLE OF ARTICLES

1	GENERAL PROVISIONS
2	TRANSMISSION OF DIGITAL DATA
3	LICENSE CONDITIONS
4	LICENSING FEE OR OTHER COMPENSATION

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 The purpose of this Agreement is to grant a license from the Transmitting Party to the Receiving Party for the Receiving Party's use of Digital Data and to set forth the license terms.

§ 1.2 This Agreement is the entire and integrated agreement between the Parties. Except as specifically set forth herein, this Agreement does not create any other contractual relationship between the Parties.

§ 1.3 Confidential Digital Data is Digital Data containing confidential or business proprietary information that the Transmitting Party designates as "confidential."

ARTICLE 2 TRANSMISSION OF DIGITAL DATA

§ 2.1 The Transmitting Party grants to the Receiving Party a nonexclusive limited license to use the Digital Data solely and exclusively for the uses, and in accordance with the terms, set forth in Article 3.

§ 2.2 Only the Receiving Party is permitted to access and use the Digital Data. Unlicensed and unauthorized access or use by third parties is strictly prohibited except as set forth in Section 2.4.1.

§ 2.3 The transmission of Digital Data constitutes a warranty by the Transmitting Party to the Receiving Party that the Transmitting Party is the copyright owner of the Digital Data or otherwise has permission to transmit the Digital Data to the Receiving Party for its use on the Project in accordance with the terms and conditions of this Agreement.

§ 2.4 Where the Transmitting Party has designated information furnished pursuant to this Agreement as "confidential," the Receiving Party shall keep the information confidential and shall not disclose it to any other person or entity except as set forth in Section 2.4.1.

§ 2.4.1 The Receiving Party may disclose Confidential Digital Data after seven (7) days' notice to the Transmitting Party where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Receiving Party may also disclose Confidential Digital Data to its employees, consultants, sureties, subcontractors and their employees, sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.5 By transmitting Digital Data, the Transmitting Party does not convey any ownership right in the Digital Data or in the software used to generate the Digital Data. Unless otherwise granted in a separate license, the Receiving Party's right to use, modify, or further transmit Digital Data is specifically limited to those uses, and in accordance with the terms, set forth in Article 3, and nothing contained in this Agreement conveys any other right to use the Digital Data.

§ 2.6 To the fullest extent permitted by law, the Receiving Party shall indemnify and defend the Transmitting Party from and against all claims arising from or related to the Receiving Party's modification to, or unlicensed use of, the Digital Data.

§ 2.7 Transmission of the Digital Data does not abridge or extinguish the Transmitting Party's rights, including, to the extent applicable, exclusive ownership interest, in such information under all applicable state, federal, and international laws including, without limitation, laws governing the protection of copyrights and intellectual property.

§ 2.8 The provisions of this Article 2 shall survive the termination of this Agreement.

ARTICLE 3 LICENSE CONDITIONS

§ 3.1 The Receiving Party may use and rely upon the Digital Data to the extent set forth in this Article 3.

(Paragraph deleted)

[X] § 3.1.1 The Digital Data is transmitted solely for the Receiving Party's information. Receiving Party acknowledges that any use of the Digital Data shall be at Receiving Party's sole risk. The Receiving Party accepts the Digital Data "as is" without any warranty or representations from the Transmitting Party as to whether the Digital Data is accurate, complete, or fit for use as intended by the Receiving Party. The Receiving Party is solely responsible for verifying whether the Digital Data is accurate, complete, or fit for the Receiving Party's intended use.

(Paragraphs deleted)

§ 3.1.1.1 This Digital Data is part of the Transmitting Party's Instruments of Service and shall not be used by Receiving Party or anyone else receiving this data through or from the Receiving Party for any purpose other than as a convenience in the preparation of bid submittals, shop drawings, coordination drawings, construction phase submittals, and field layout and staking required by the Owner for the exclusive use of the referenced Project. Any use or reuse by the Receiving Party or by others will be at the Receiving Party's sole risk and without liability or legal exposure to Transmitting Party. The Receiving Party agrees to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against Transmitting Party, its officers, directors, employees, or subconsultants that may arise out of or in connection with Receiving Party's use of this Digital Data.

§ 3.1.1.2 No representation as to the compatibility of this Digital Data with Receiving Party's hardware or software is provided.

§ 3.1.1.3 This Digital Data is not a Construction Document. Differences may exist between this Digital Data and corresponding two-dimensional hard-copy Construction Document. The Transmitting Party makes no representation regarding the accuracy or completeness of the Digital Data the Receiving Party receives. In the event that a conflict arises between the signed/sealed two-dimensional hard-copy Construction Document prepared by Transmitting Party and the Digital Data, the signed/sealed two-dimensional hard-copy Construction Document shall govern. The Receiving Party is responsible for determining if any conflict exists. By the Receiving Party's use of this Digital Data, Receiving Party is not relieved of their duty to fully comply with the Contract Documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, field measurements, verify field conditions and coordination of work with that of other contractors for the Project.

§ 3.1.1.4 Because information presented in the Digital Data can be modified, unintentionally or otherwise, the Transmitting Party reserves the right to remove all indicia of ownership and/or involvement from each Digital Data.

§ 3.1.1.5 Under no circumstances shall delivery of this Digital Data for use by the Receiving Party be deemed a sale of document ownership by Transmitting Party, and no warranties, either express or implied, of merchantability or fitness for any particular purpose is made. In no event shall the Transmitting Party be liable for any loss of profit or any consequential damages as a result of the Receiving Party's use or reuse of this Digital Data.

§ 3.1.1.6 The Digital Data file does not necessarily contain all the information that is required to produce finished Construction Documents. Because of this, there may be data within the Digital Data that is missing, incomplete or even contradictory to the information provided in the final two dimensional Construction Documents.

§ 3.1.1.7 Professional judgment will need to be used by the Receiving Party, along with reasonable expectations and interpretations in order to use the Digital Data for its intended purpose. Should the Transmitting Party provide revised and updated copies of the Digital Data to the Receiving Party throughout the Project, all terms and conditions of this agreement will be applicable and unchanged for all subsequent transmissions of the Digital Data

Init.

ARTICLE 4 LICENSING FEE OR OTHER COMPENSATION

The Receiving Party agrees to pay the Transmitting Party the following fee or other compensation for the Receiving Party's use of the Digital Data:

(State the fee, in dollars, or other method by which the Receiving Party will compensate the Transmitting Party for the Receiving Party's use of the Digital Data.)

This Agreement is entered into as of the day and year first written above and terminates one year from said date, except as set forth below.

(Indicate when this Agreement will terminate, if other than one year from the date it was entered into, and other conditions related to termination.)

N/A

PARKHILL

[RECEIVING PARTY]

TRANSMITTING PARTY *(Signature)*

RECEIVING PARTY *(Signature)*

(Printed name and title)

(Printed name and title)

**RFI
No.**

TO: **Parkhill**

FROM:

PROJECT NAME:

PARKHILL PROJECT NO.:

Issue Date:		*Requested Reply Date:	
-------------	--	------------------------	--

*Items to be completed by Contractor before submittal to Parkhill for review. RFI form must be fully completed for Parkhill to respond.

***RFI DESCRIPTION:** (Fully describe the question or type of information requested. Provide photos and/or sketches as applicable to help with the description.)

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

Specifications	Drawings	Other

***CONTRACTOR'S PROPOSED SOLUTION:** (If RFI concerns a site or construction condition, the sender shall provide a recommended solution, including cost and/or schedule considerations before Parkhill can respond. The proposal solution shall consist of a revised text, sketches, drawings, etc. as applicable to a full and complete explanation.)

*Submitted by:

RESPONSE: (Provide answer to RFI, including cost and/or schedule considerations, revised text, sketches, drawings, etc. as applicable to fully explain response.)

Attachments:

Response by:

Copies: Owner

Consultants

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

AIA[®] Document C106™ – 2022

Digital Data Licensing Agreement

AGREEMENT made as of the day of in the year
(In words, indicate day, month, and year.)

BETWEEN the Party transmitting Digital Data ("Transmitting Party"):
(Name, address, and contact information, including electronic addresses)

and the Party receiving the Digital Data ("Receiving Party"):
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(Name and location or address of the Project)

for the following Digital Data ("Digital Data"):
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§ 2.2 Only the Receiving Party is permitted to access and use the Digital Data. Unlicensed and unauthorized access or use by third parties is strictly prohibited except as set forth in Section 2.4.1.

§ 2.3 The transmission of Digital Data constitutes a warranty by the Transmitting Party to the Receiving Party that the Transmitting Party is the copyright owner of the Digital Data or otherwise has permission to transmit the Digital Data to the Receiving Party for its use on the Project in accordance with the terms and conditions of this Agreement.

§ 2.4 Where the Transmitting Party has designated information furnished pursuant to this Agreement as "confidential," the Receiving Party shall keep the information confidential and shall not disclose it to any other person or entity except as set forth in Section 2.4.1.

§ 2.4.1 The Receiving Party may disclose Confidential Digital Data after seven (7) days' notice to the Transmitting Party where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Receiving Party may also disclose Confidential Digital Data to its employees, consultants, sureties, subcontractors and their employees, sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.5 By transmitting Digital Data, the Transmitting Party does not convey any ownership right in the Digital Data or in the software used to generate the Digital Data. Unless otherwise granted in a separate license, the Receiving Party's right to use, modify, or further transmit Digital Data is specifically limited to those uses, and in accordance with the terms, set forth in Article 3, and nothing contained in this Agreement conveys any other right to use the Digital Data.

§ 2.6 To the fullest extent permitted by law, the Receiving Party shall indemnify and defend the Transmitting Party from and against all claims arising from or related to the Receiving Party's modification to, or unlicensed use of, the Digital Data.

§ 2.7 Transmission of the Digital Data does not abridge or extinguish the Transmitting Party's rights, including, to the extent applicable, exclusive ownership interest, in such information under all applicable state, federal, and international laws including, without limitation, laws governing the protection of copyrights and intellectual property.

§ 2.8 The provisions of this Article 2 shall survive the termination of this Agreement.

Init.

ARTICLE 3 LICENSE CONDITIONS

§ 3.1 The Receiving Party may use and rely upon the Digital Data to the extent set forth in this Article 3.

(Paragraph deleted)

[X] § 3.1.1 The Digital Data is transmitted solely for the Receiving Party's information. Receiving Party acknowledges that any use of the Digital Data shall be at Receiving Party's sole risk. The Receiving Party accepts the Digital Data "as is" without any warranty or representations from the Transmitting Party as to whether the Digital Data is accurate, complete, or fit for use as intended by the Receiving Party. The Receiving Party is solely responsible for verifying whether the Digital Data is accurate, complete, or fit for the Receiving Party's intended use.

(Paragraphs deleted)

§ 3.1.1.1 This Digital Data is part of the Transmitting Party's Instruments of Service and shall not be used by Receiving Party or anyone else receiving this data through or from the Receiving Party for any purpose other than as a convenience in the preparation of bid submittals, shop drawings, coordination drawings, construction phase submittals, and field layout and staking required by the Owner for the exclusive use of the referenced Project. Any use or reuse by the Receiving Party or by others will be at the Receiving Party's sole risk and without liability or legal exposure to Transmitting Party. The Receiving Party agrees to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against Transmitting Party, its officers, directors, employees, or subconsultants that may arise out of or in connection with Receiving Party's use of this Digital Data.

§ 3.1.1.2 No representation as to the compatibility of this Digital Data with Receiving Party's hardware or software is provided.

§ 3.1.1.3 This Digital Data is not a Construction Document. Differences may exist between this Digital Data and corresponding two-dimensional hard-copy Construction Document. The Transmitting Party makes no representation regarding the accuracy or completeness of the Digital Data the Receiving Party receives. In the event that a conflict arises between the signed/sealed two-dimensional hard-copy Construction Document prepared by Transmitting Party and the Digital Data, the signed/sealed two-dimensional hard-copy Construction Document shall govern. The Receiving Party is responsible for determining if any conflict exists. By the Receiving Party's use of this Digital Data, Receiving Party is not relieved of their duty to fully comply with the Contract Documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, field measurements, verify field conditions and coordination of work with that of other contractors for the Project.

§ 3.1.1.4 Because information presented in the Digital Data can be modified, unintentionally or otherwise, the Transmitting Party reserves the right to remove all indicia of ownership and/or involvement from each Digital Data.

§ 3.1.1.5 Under no circumstances shall delivery of this Digital Data for use by the Receiving Party be deemed a sale of document ownership by Transmitting Party, and no warranties, either express or implied, of merchantability or fitness for any particular purpose is made. In no event shall the Transmitting Party be liable for any loss of profit or any consequential damages as a result of the Receiving Party's use or reuse of this Digital Data.

§ 3.1.1.6 The Digital Data file does not necessarily contain all the information that is required to produce finished Construction Documents. Because of this, there may be data within the Digital Data that is missing, incomplete or even contradictory to the information provided in the final two dimensional Construction Documents.

§ 3.1.1.7 Professional judgment will need to be used by the Receiving Party, along with reasonable expectations and interpretations in order to use the Digital Data for its intended purpose. Should the Transmitting Party provide revised and updated copies of the Digital Data to the Receiving Party throughout the Project, all terms and conditions of this agreement will be applicable and unchanged for all subsequent transmissions of the Digital Data

Init.

ARTICLE 4 LICENSING FEE OR OTHER COMPENSATION

The Receiving Party agrees to pay the Transmitting Party the following fee or other compensation for the Receiving Party's use of the Digital Data:

(State the fee, in dollars, or other method by which the Receiving Party will compensate the Transmitting Party for the Receiving Party's use of the Digital Data.)

This Agreement is entered into as of the day and year first written above and terminates one year from said date, except as set forth below.

(Indicate when this Agreement will terminate, if other than one year from the date it was entered into, and other conditions related to termination.)

N/A

PARKHILL

[RECEIVING PARTY]

TRANSMITTING PARTY *(Signature)*

RECEIVING PARTY *(Signature)*

(Printed name and title)

(Printed name and title)

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination Drawings.
 - 3. Requests for Information (RFI).
 - 4. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 73 00 "Execution:" Procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 01 77 00 "Closeout Procedures:" Coordinating closeout of the Contract.
 - 4. Section 01 91 00 "Commissioning:" Coordinating the Work with Owner's Commissioning Authority.
 - a. Specific and unique commissioning requirements for the Data Center scope of Work are distinctly different from commissioning requirements for the general building.

1.2 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.

1.3 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of 1 part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.

- B. 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.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.4 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's Work or Work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Architect.
 - 6. RFI number, numbered sequentially.
 - 7. RFI subject.
 - 8. Specification Section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.
 - 10. Field dimensions and conditions, as appropriate.
 - 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 12. Contractor's signature.
 - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination Drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
 - 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow 7 working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 - 1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 - 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 - 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01.
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use CSI Log Form 13.2B. Software log with not less than the following:
 - 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect.
 - 4. RFI number including RFIs that were returned without action or withdrawn.
 - 5. RFI description.
 - 6. Date the RFI was submitted.
 - 7. Date Architect's response was received.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within 7 days if Contractor disagrees with response.
 - 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 - 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.5 PROJECT MEETINGS

- A. General: Contractor will schedule and conduct meetings and conferences at Project site unless otherwise indicated.
- B. Preconstruction Conference: Contractor will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
 - 1. Conduct the conference to review responsibilities and personnel assignments.

2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Critical work sequencing and long-lead items.
 - c. Designation of key personnel and their duties.
 - d. Lines of communications.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Preparation of record documents.
 - l. Use of the premises.
 - m. Work restrictions.
 - n. Working hours.
 - o. Responsibility for temporary facilities and controls.
 - p. Procedures for moisture and mold control.
 - q. Procedures for disruptions and shutdowns.
 - r. Construction waste management and recycling.
 - s. Parking availability.
 - t. Office, work, and storage areas.
 - u. Equipment deliveries and priorities.
 - v. First aid.
 - w. Security.
 - x. Progress cleaning.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
- D. Project Closeout Conference: Contractor will schedule and conduct a Project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
- E. Progress Meetings: Contractor will conduct progress meetings at weekly intervals.
 1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, samples, and other submittals.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 29 00 "Payment Procedures": Submitting Applications for Payment and the schedule of values.
 - 3. Section 01 31 00 "Project Management and Coordination."
 - 4. Section 01 40 00 "Quality Requirements."
 - 5. Section 01 77 00 "Closeout Procedures."
 - 6. Section 01 78 23 "Operation and Maintenance Data": Submitting operation and maintenance manuals.
 - 7. Section 01 78 39 "Project Record Documents": Submitting record Drawings, record Specifications, and record Product Data.
 - 8. Section 01 79 00 "Demonstration and Training": Submitting video recordings of demonstration of equipment and training of Owner's personnel.
 - 9. Section 01 91 00 "Commissioning."

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.3 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 - 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 - 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled date of fabrication.
 - h. Scheduled dates for purchasing.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 - 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- C. Processing Time: Allow time for submittal review, including time for resubmittals. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 7 days for review of each resubmittal.
 - 4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect, before returned to Contractor.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 - 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Name of subcontractor.
 - f. Name of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06 10 00.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
- E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
 - 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 - 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use Project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-06 10 00.01.A).
 - 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
- F. Options: Identify options requiring selection by Architect.

- G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Post electronic submittals as PDF electronic files directly to specifically established for Project.
 - 2. Submit electronic submittals via email as PDF electronic files.
 - a. Architect will return annotated file. Annotate and retain 1 copy of file as an electronic Project record document file.
 - 3. Action Submittals: Submit 3 paper copies of each submittal unless otherwise indicated. Architect will return 2 copies.
 - 4. Informational Submittals: Submit 2 paper copies of each submittal unless otherwise indicated. Architect will not return copies.
 - 5. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Application of testing agency labels and seals.
 - 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - 5. Submit Product Data before or concurrent with samples.

- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data Drawing files is otherwise permitted.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 - 2. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Samples: Submit samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit samples that contain multiple, related components such as accessories together in 1 submittal package.
 - 2. Identification: Attach label on unexposed side of samples that includes the following:
 - a. Generic description of sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 - 3. For projects where electronic submittals are required, provide corresponding electronic submittal of sample transmittal, digital image file illustrating sample characteristics, and identification information for record.
 - 4. Disposition: Maintain sets of approved samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
- E. Coordination Drawing Submittals: Comply with requirements specified in Section 01 31 00 "Project Management and Coordination."
- F. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 29 00 "Payment Procedures."
- G. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 01 40 00 "Quality Requirements."
- H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 77 00 "Closeout Procedures."
- I. Maintenance Data: Comply with requirements specified in Section 01 78 23 "Operation and Maintenance Data."
- J. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

- K. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- L. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 77 00 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

- C. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- D. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.
- C. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 33 00 "Submittal Procedures."
 - 3. Section 01 73 00 "Execution."

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- D. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- E. Field Quality-Control Testing: Tests and inspections that are performed onsite for installation of the Work and for completed Work.
- F. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

- G. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- H. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of 5 previous projects similar in nature, size, and extent to this Project; familiar with special requirements indicated; and complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.

1.5 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than 5 days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
- C. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring Work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- D. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.6 REPORTS AND DOCUMENTS

- A. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of technical representative making report.
 - 2. Statement on condition of substrates and acceptability for installation of product.
 - 3. Statement that products at Project site comply with requirements.
 - 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 6. Statement whether conditions, products, and installation will affect warranty.
 - 7. Other required items indicated in individual Specification Sections.
- B. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of factory-authorized service representative making report.
 - 2. Statement that equipment complies with requirements.
 - 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 4. Statement whether conditions, products, and installation will affect warranty.
 - 5. Other required items indicated in individual Specification Sections.

- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Architect Qualifications: An Architect who is legally qualified to practice in jurisdiction where Project is located and is experienced in providing architectural services of the kind indicated.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
- G. Testing Agency Qualifications: An NRTL, NVLAP, or independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST - National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.8 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - 2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 - 4. Where quality-control services are indicated as Contractor responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Architect, Commissioning Authority, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect, Commissioning Authority, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected Work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 - 6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.

3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.9 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect, Commissioning Authority, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect and Commissioning Authority with copy to Contractor and to authorities having jurisdiction.
 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retesting and re-inspecting corrected Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architects and Commissioning Authorities reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved:" When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed:" A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated:" Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations:" Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish:" Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install:" Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide:" Furnish and install, complete and ready for the intended use.
- I. "Project Site:" Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
 - 1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 10 00 "Summary."
 - 3. Section 01 57 19 "Temporary Environmental Controls."
 - 4. Section 01 73 00 "Execution."
 - 5. Section 01 77 00 "Closeout Procedures."

1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

1.3 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel. Coordinate with Owner.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 3. Indicate sequencing of Work that requires water and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- D. Dust- and HVAC-Control Plan: Submit coordination Drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
 - 1. Locations of dust-control partitions at each phase of Work.
 - 2. HVAC system isolation schematic drawing.
 - 3. Location of proposed air-filtration system discharge.
 - 4. Waste handling procedures.
 - 5. Other dust-control measures.
 - 6. Incorporate requirements of Owner's Infectious Control office.
- E. Provide Environmental Protection Plan that complies with Section 01 57 19 "Temporary Environmental Controls" and with the Owner's Infectious Control Plan for Construction.

1.4 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.
- C. Coordinate with Owner any staging or temporary facilities that are not located in the area of Work in the Basement.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL-rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 01 77 00 "Closeout Procedures."

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Parking: Provide temporary parking areas for construction personnel.
- B. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 - 1. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
- C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 73 00 "Execution."
- D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- C. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION

SECTION 01 57 19 - TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Environmental protection requirements.
 - 2. Protection of natural resources.
 - 3. Erosion and sediment control measures.
 - 4. Control and disposal of solid and sanitary wastes.
 - 5. Owner infectious control requirements.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. These publications form a part of this Specification to extent referenced and are referred to in text by basic designation only.
 - 1. 29 CFR 1910-Subpart G - Occupational Health and Environmental Control.
 - 2. Corps of Engineers (COE) COE EP-1165-2-304 - 1976 Flood Plain Regulations for Flood Plain Management.
- B. UMC Infectious Control Plan, specifically requirements for Class IV Construction Projects.

1.3 DEFINITIONS

- A. Sediment: Soil and other debris that eroded and was transported by runoff water or wind.
- B. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, agricultural operations, and community activities.
- C. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass, crockery, metal, lumber, cans, and bones.
- D. Debris: Combustible and noncombustible wastes such as ashes and waste materials resulting from construction or maintenance and repair work, leaves, and tree trimmings.
- E. Chemical Wastes: Salts, acids, alkalis, herbicides, pesticides, organic chemicals, and spent products which serve no purpose.
- F. Sanitary Wastes: Sewage.
- G. Wastes Characterized as Domestic Sanitary Sewage: Garbage.
 - 1. Refuse and scraps resulting from preparation, cooking, dispensing, and consuming food.
- H. Oily Waste: Petroleum products and bituminous materials.

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

- A. Provide and maintain, during life of Contract, environmental protection as defined. Contractor shall comply with all requirements as described in Construction General Permit (TXR150000). Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions to develop during construction of permanent or temporary environmental features associated with Project. Comply with federal, state, and local regulations pertaining to environment, including but not limited to water, air, and noise pollution.

- B. Best Management Practices (BMPs):
1. Waste Materials: Collect and store all waste materials, including construction debris, in a securely-lidded metal dumpster. Do not bury construction material onsite. Transit dumpster shall comply with ordinance 18.52.010 (enclosure and removal of waste materials during construction). Dumpster shall be emptied as necessary or as required by ordinance 9.04 (solid waste management) and trash hauled to licensed landfill.
 2. Hazardous Waste: At minimum, products in the following categories are considered hazardous: paint, acids for cleaning masonry surfaces, cleaning solvents, asphalt products, chemical additives for spill stabilization, curing compounds, and additives. In the event of a spill which may be hazardous, Contractor shall take immediate action and contact the fire department and TCEQ.
 3. Sanitary Waste: All shall be collected from construction portable units as necessary or required, chapter 18.08 (building code), by a licensed sanitary waste management contractor. All waste material shall be responsibility of Contractor.
 4. Spill Prevention: Use these practices to reduce risk of spills or other accidental exposures of materials to stormwater runoff:
 - a. Good Housekeeping:
 - 1) Store only enough products required to do job.
 - 2) Neatly and orderly store materials onsite.
 - 3) Keep products in original container.
 - 4) Do not mix substances with one another, unless otherwise recommended by manufacturer.
 - 5) Use entire contents of product before disposing container.
 - 6) Follow manufacturer's recommendations for proper use and disposal.
 - b. Hazardous Products: Practices used to reduce risks:
 - 1) Keep products in original container if possible.
 - 2) Retain original labels, product information, and material safety data sheets (MSDS).
 - 3) Dispose surplus product per manufacturer- or local- and state- recommended methods.
 - c. Petroleum Products: Monitor all onsite vehicles for leaks and receive regular preventive maintenance to reduce chance of spills. Store petroleum in tightly-sealed containers, clearly labeled. Apply any asphalt substances used onsite per manufacturer recommendation.
 5. Spill Control Practices:
 - a. Clearly post manufacturer-recommended methods for spill cleanup and site personnel made aware of procedures.
 - b. Keep materials and equipment necessary for spill cleanup in material storage area onsite.
 - c. Clean all spills immediately after discovery.
 - d. Spill area shall be well ventilated and appropriate clothing worn.
 - e. Report any spill to appropriate governmental agency.
 - f. Take measures to prevent a spill from reoccurring.
 6. Maintenance and Inspection Procedures: Inspect all pollution prevention measures at least once a month and following a storm event of 0.5 inches or more, BMPs and pollution control procedures shall be inspected for adequacy. A record of result of inspections of site shall be kept onsite.

7. Remarks: Construct disposal areas, stockpiles, and haul roads to minimize and control amount of sediment that may enter receiving waters or streambeds. Construction staging areas and vehicle maintenance areas shall be constructed by Contractor to minimize runoff of pollutants.
- C. Perform a preconstruction survey of Project site with Architect; assess existing environmental conditions in and adjacent to site.
- D. Infectious Control:
 1. Isolate HVAC system in area where Work is being done to prevent contamination of the duct system. Complete all critical barriers, i.e., sheetrock, plywood, plastic, to seal area from non-work area or implement control cube method (cart with plastic covering and sealed connection to Work site with HEPA vacuuming prior to exit) before construction begins.
 2. Maintain negative air pressure within Work site utilizing HEPA-equipped air filtration units.
 3. Seal holes, pipes, conduits, and punctures appropriately.
 4. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving Work site or they can wear cloth or paper coveralls that are removed each time they leave the Work site.
 5. All personnel entering Work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the Work area.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONTROL AND DISPOSE SOLID AND SANITARY WASTES

- A. Pick up solid wastes and place in containers regularly emptied. Do not prepare, cook, or dispose food on Project site. Prevent contamination of site of other areas when handling and disposing wastes. On completion, leave areas clean. Control and dispose waste.
 1. Dispose Rubbish and Debris per requirements specified in area as directed by Owner. Rubbish may be disposed in current landfill if all rules for disposal are followed.
 2. Garbage Disposal: Place garbage in approved containers and move to a pickup point or disposal area, where directed.

3.2 DUST CONTROL

- A. Contractor will be fully responsible for dust control along all haul roads and in Project area. Contractor shall minimize dust down at all times, including nonworking periods. Sprinkle or treat with dust suppressants, site soil, haul roads, and other areas disturbed by operations.

3.3 INFECTIOUS CONTROL

- A. Do not remove barriers from Work area until completed Project is inspected by the Owner's Safety Department and Infection Prevention and Control Department, and thoroughly cleaned by Environmental Services.
- B. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction.
- C. Contain construction waste before transport in tightly-covered containers.
- D. Cover transport receptacles or carts. Tape coverings unless using solid lid.

- E. Vacuum Work area with HEPA-filtered vacuums.
- F. Wet mop area with cleaner and disinfectants.
- G. Upon completion, restore HVAC system where Work is performed.

END OF SECTION

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 25 00 "Substitution Procedures": Requests for substitutions.
 - 3. Section 01 33 00 "Submittal Procedures."
 - 4. Section 01 77 00 "Closeout Procedures."

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by a manufacturer product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
- B. Basis-of-Design Product Specification: A Specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the Specification.

1.3 ACTION SUBMITTALS

- A. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 33 00 "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between 2 or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 6. Protect stored products from damage and liquids from freezing.
 - 7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 - 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
 - 1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - 3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - b. Non-restricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
 - 4. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - b. Non-restricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures," for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 10 00 "Summary": Limits on use of Project site.
 - 3. Section 01 30 00 "Administrative Requirements."
 - 4. Section 01 31 00 "Project Management and Coordination."
 - 5. Section 01 33 00 "Submittal Procedures": Submitting surveys.
 - 6. Section 01 40 00 "Quality Requirements."
 - 7. Section 01 77 00 "Closeout Procedures": Submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
 - 8. Section 01 91 00 "Commissioning."

1.2 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.

1.3 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. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 2. Furnish location data for Work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

- C. 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.
- D. 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 according to requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical Work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from 2 or more locations.
- D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 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. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.

- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- F. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 - 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 degrees F.
 - 3. 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.
- B. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- C. Site: Maintain Project site free of waste materials and debris.

- D. 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.
- E. 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.
- F. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- G. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- H. Waste Disposal: Do not bury or burn waste materials onsite. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- I. 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.
- J. 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.
- K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 01 91 00 "Commissioning."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 50 00 "Temporary Facilities and Controls."

1.2 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - 1. Comply with operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Section 01 50 00 "Temporary Facilities and Controls," for controlling dust and dirt, environmental protection, and noise control.

3.2 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate onsite.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 73 00 "Execution:" Progress cleaning of Project site.
 - 3. Section 01 74 19 "Construction Waste Management and Disposal."
 - 4. Section 01 78 23 "Operation and Maintenance Data": Operation and maintenance manual requirements.
 - 5. Section 01 78 39 "Project Record Documents": Submitting record Drawings, record Specifications, and record Product Data.
 - 6. Section 01 79 00 "Demonstration and Training": Requirements for instructing Owner's personnel.

1.2 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.3 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

2. Submit closeout submittals specified in other Division 01 Sections, including Project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
 5. Submit test/adjust/balance records.
 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
 6. Advise Owner of changeover in heat and other utilities.
 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 9. Complete final cleaning requirements, including touchup painting.
 10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.6 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion - before requesting final inspection for determining final completion, complete the following:
 - 1. Submit a final Application for Payment according to Section 01 29 00 "Payment Procedures."
 - 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punchlist), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
 - 4. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Architect will return annotated file.
 - b. PDF electronic file. Architect will return annotated file.
 - c. Three paper copies. Architect will return 2 copies.

1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2- by 11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - g. Sweep concrete floors broom clean in unoccupied spaces.
 - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - j. Remove labels that are not permanent.
 - k. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - n. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
 - o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - p. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 33 00 "Submittal Procedures": Submitting copies of submittals for operation and maintenance manuals.
 - 3. Section 01 77 00 "Closeout Procedures."
 - 4. Section 01 91 00 "Commissioning": Verification and compilation of data into operation and maintenance manuals.

1.2 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect and Commissioning Authority will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
 - 2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return 2 copies.

- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect and Commissioning Authority will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
 - 1. List of documents.
 - 2. List of systems.
 - 3. List of equipment.
 - 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4 - Preparation of Operating and Maintenance Documentation for Building Systems.

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Architect.
 - 7. Name and contact information for Commissioning Authority.

8. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
9. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 1. If operation or maintenance documentation requires more than 1 volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of 1 system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
 1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2- by 11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If 2 or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
 4. Supplementary Text: Prepared on 8-1/2- by 11-inch white bond paper.
 5. Drawings: Attach reinforced, punched binder tabs on Drawings and bind with text.
 - a. If oversize Drawings are necessary, fold Drawings to same size as text pages and use as foldouts.
 - b. If Drawings are too large to be used as foldouts, fold and place Drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating Drawing titles, descriptions of contents, and Drawing locations.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.
 - 4. Water leak.
 - 5. Power failure.
 - 6. Water outage.
 - 7. System, subsystem, or equipment failure.
 - 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
 - 1. Instructions on stopping.
 - 2. Shutdown instructions for each type of emergency.
 - 3. Operating instructions for conditions outside normal operating limits.
 - 4. Required sequences for electric or electronic systems.
 - 5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Contractor has delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.
- B. Descriptions include the following:
 - 1. Product name and model number. Use designations for products indicated on Contract Documents.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function.
 - 5. Operating characteristics.
 - 6. Limiting conditions.
 - 7. Performance curves.

8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures include the following, as applicable:
 1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and Drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
 1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer written recommendations and:
 1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and Drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturer forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturer maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner-operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner-operating personnel.
- E. Manufacturer Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than 1 item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturer standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare Drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these Drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original Project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Section 01 78 39 "Project Record Documents."
- G. Comply with Section 01 77 00 "Closeout Procedures," for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for Project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 33 00 "Submittal Procedures."
 - 3. Section 01 73 00 "Execution": Final property survey.
 - 4. Section 01 77 00 "Closeout Procedures": General closeout procedures.
 - 5. Section 01 78 23 "Operation and Maintenance Data": Operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit 1 set of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit 1 paper-copy set of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and 1 set of file prints.
 - 3) Submit record digital data files and 1 set of plots.
 - 4) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit 3 paper-copy sets of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and 3 sets of prints.
 - 3) Print each Drawing, whether or not changes and additional information were recorded.
 - c. Final Submittal:
 - 1) Submit 1 paper-copy set of marked-up record prints.
 - 2) Submit record digital data files and 3 set of record digital data file plots.
 - 3) Plot each Drawing file, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into Project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain 1 set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable Drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 - 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect and Construction Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
 - 1. Format: Annotated PDF electronic file with comment function enabled.
 - 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 - 3. Refer instances of uncertainty to Architect through Construction Manager for resolution.
 - 4. Architect will furnish Contractor 1 set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 01 33 00 "Submittal Procedures," for requirements related to use of Architect's digital data files.
 - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Format: Identify and date each record Drawing; include "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Format: Annotated PDF electronic file with comment function enabled.
 - 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 - 4. Identification as follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 - 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.
 - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as scanned PDF electronic file(s) of marked-up miscellaneous record submittals.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain 1 copy of each submittal during the construction period for Project record document purposes. Post changes and revisions to Project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and samples in the field office apart from the Contract Documents used for construction. Do not use Project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project record documents for Architect's and Construction Manager's reference during normal working hours.

END OF SECTION

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.
- B. Allowances: Furnish demonstration and training instruction time under the Demonstration and Training Allowance as specified.
- C. Unit Price for Instruction Time: Length of instruction time will be measured by actual time spent performing demonstration and training in required location. No payment will be made for time spent assembling educational materials, setting up, or cleaning up.
- D. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For instructor videographer.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit 2 copies within 7 days of end of each training module.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name and address of videographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date of video recording.

2. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
3. At completion of training, submit complete training manual(s) for Owner's use in PDF electronic file format on compact disc.

1.4 QUALITY ASSURANCE

- A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 "Quality Requirements," experienced in operation and maintenance procedures and training.
- B. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- C. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
 1. Inspect and discuss locations and other facilities required for instruction.
 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 3. Review required content of instruction.
 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
 - 3. Owner will furnish Contractor with names and positions of participants.
- B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season. Schedule training with Owner with at least 7 days' advance notice.
- C. Training Location and Reference Material: Conduct training onsite in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- D. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Video: Provide minimum 640 x 480 video resolution converted to format file type acceptable to Owner, on electronic media.
 - 1. Electronic Media: Read-only format compact disc acceptable to Owner, with commercial-grade graphic label.
 - 2. File Hierarchy: Organize folder structure and file locations according to Project Manual table of contents. Provide complete screen-based menu.
 - 3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project Specifications.
 - 4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:
 - a. Name of Contractor/Installer.
 - b. Business address.
 - c. Business phone number.
 - d. Point of contact.
 - e. E-mail address.

- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
 - 1. Film training session(s) in segments not to exceed 15 minutes.
 - a. Produce segments to present a single significant piece of equipment per segment.
 - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
 - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording. Furnish additional portable lighting as required.
- E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.
- F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- G. Pre-produced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION

SECTION 01 91 00 - COMMISSIONING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Building commissioning of the following systems:
 - a. HVAC components and equipment.
 - b. HVAC system: Interaction of cooling, heating, and comfort delivery systems.
 - c. Building Automation System (BAS): Control hardware and software, sequence of operations, and integration of factory controls with BAS.
 - d. Lighting Control System and interface with daylighting.
 - e. Domestic hot water systems.
 - f. Renewable energy generation systems.
- B. Owner, Architect, and Commissioning Agent are not responsible for construction means, methods, job safety, or management function related to commissioning on the job site.
- C. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 40 00 "Quality Requirements."
 - 3. Section 01 78 23 "Operation and Maintenance Data."
 - 4. Section 23 05 00 "General Mechanical Requirements."
 - 5. Section 26 05 00 "Basic Electrical Methods."

1.2 DEFINITIONS

- A. Basis of Design: The basis of design is the documentation of the primary thought processes and assumptions behind design decisions that were made to meet Owner Project Requirements. The basis of design describes the systems, components, conditions, and methods chosen to meet the intent. Some reiterating of Owner Project Requirements may be included.
- B. Commissioning: Commissioning is a comprehensive and systematic process to verify building systems perform as designed to meet the Owner requirements. Commissioning during the construction, acceptance, and warranty phases is intended to achieve the following specific objectives:
 - 1. Verify and document that equipment is installed and started per manufacturer recommendations, industry accepted minimum standards, and Contract Documents.
 - 2. Verify and document that equipment and systems receive complete operational checkout by installing contractors.
 - 3. Verify and document equipment and system performance.
 - 4. Verify the completeness of operations and maintenance materials.
 - 5. Ensure Owner operating personnel are adequately trained on the operation and maintenance of building equipment.
 - 6. The commissioning process does not take away from or reduce the responsibility of the system designers or installing contractors to provide a finished and fully functioning product.
- C. Commissioning Plan: An overall plan that provides the structure, schedule, and coordination planning for the commissioning process.
- D. Deficiency: A condition in the installation or function of a component, piece of equipment, or system not in compliance with the Contract Documents, does not perform properly, or is not complying with Owner Project Requirements.

- E. Owner Project Requirements: A dynamic document that provides the explanation of the ideas, concepts, and criteria considered very important to the Owner. It is initially the outcome of the programming and conceptual design phases.
- F. Functional Performance Test: Test of the dynamic function and operation of equipment and systems using manual (direct observation) or monitoring methods. Functional testing is the dynamic testing of systems (rather than just components) under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint). Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc. The systems are run through all the control system's sequences of operation and components are verified to be responding as the sequences state. Traditional air or water test and balancing (TAB) is not functional testing, in the commissioning sense of the word. TAB's primary work is setting up the system flows and pressures as specified, while functional testing is verifying that which has already been set up. The Commissioning Agent develops the functional test procedures in a sequential written form, coordinates, oversees and documents the actual testing, which is usually performed by the installing contractor or vendor. Functional Performance Tests are performed after prefunctional checklists and startup are complete.
- G. Manual Test: Using hand-held instruments, immediate control system readouts or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the "observation").
- H. Monitoring: Recording parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of control systems.
- I. Non-Compliance: See Deficiency.
- J. Non-Conformance: See Deficiency.
- K. Pre-functional Checklist: A list of items to inspect and elementary component tests to conduct to verify proper installation of equipment, provided by the Commissioning Agent to the contractor. Pre-functional checklists are primarily static inspections and procedures to prepare the equipment or system for initial operation (e.g., belt tension, oil levels OK, labels affixed, gages in place, sensors calibrated, etc.). However, some pre-functional checklist items entail simple testing of the function of a component, a piece of equipment or system (such as measuring the voltage imbalance on a 3-phase pump motor of a chiller system). "Pre-functional" refers to before functional testing. Pre-functional checklists augment and are combined with the manufacturer's start-up checklist.
- L. Seasonal Performance Tests: Functional Performance Test deferred until system(s) will experience conditions closer to their design conditions.
- M. Warranty Period: Warranty period for entire Project, including equipment components. Warranty begins at Substantial Completion and extends for at least 1 year, unless specifically noted otherwise in the Contract Documents and accepted submittals.

1.3 COORDINATION

- A. Perform commissioning services to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.
- B. Commissioning Agent shall provide overall coordination and management of the commissioning program as specified herein.

- C. Commissioning Team: The commissioning process will require cooperation of the Contractor, subcontractors, vendors, Architect/Engineers, Commissioning Agent, Green Consultant, and Owner. The commissioning team shall be comprised of the following.
 - 1. Contractor:
 - a. Project Manager.
 - b. Test Engineer.
 - 2. Subcontractors: As appropriate to product or system being commissioned.
 - 3. Commissioning Agent:
 - a. Project Manager.
 - b. Project Engineers.
 - 4. Owner Representative(s).
 - 5. Architect/Engineer:
 - a. Architect.
 - b. MEP engineers.
 - c. Specialty Consultant(s).
- D. Progress Meetings: Attend construction job-site meetings, as necessary, to monitor construction and commissioning progress. Coordinate with contractor to address coordination, deficiency resolution and planning issues.
 - 1. Plan and coordinate additional meetings as required to progress the Work.
- E. Site Observations: Perform site visits, as necessary, to observe component and system installations.
- F. Functional Testing Coordination:
 - 1. Equipment shall not be “temporarily” started for commissioning.
 - 2. Functional performance testing shall not begin until pre-functional, start-up and TAB is completed for a given system.
 - 3. The controls system and equipment it controls shall not be functionally tested until all points have been calibrated and pre-functional checklists are completed.

1.4 QUALITY CONTROL

- A. Qualifications for Commissioning Agents: Engage commissioning service personnel, which specialize in the types of inspections and tests to be performed.

1.5 SUBMITTALS

- A. Commissioning Agent shall submit the following:
 - 1. Basis of Design and Owner Project Requirements.
 - a. Update as necessary during the Work to reflect the progress on the components and systems.
 - 2. Scoping Meeting Minutes.
 - 3. Commissioning Plan: Submit within 30 calendar days of authorization to proceed.
 - a. Update as necessary during the Work to reflect the progress on the components and systems.
 - 4. Commissioning Schedule: Submit with Commissioning Plan.
 - a. Update as necessary during the Work to reflect the progress on the components and systems.
 - 5. Functional performance test forms: Submit minimum 30 calendar days prior to testing.

6. Deficiency Report and Resolution Record: Document items of non-compliance in materials, installation, or operation. Document the results from start-up/pre-functional checklists, functional performance testing, and short-term diagnostic monitoring. Include details of the components or systems found to be non-compliant with the Drawings and Specifications. Identify adjustments and alterations required to correct the system operation and identify who is responsible for making the corrective changes.
 - a. Update as necessary during the Work to reflect the progress on the components and systems. Forward updates to the Green Consultant in a timely manner.
7. Final Commissioning Report: Compile a final Commissioning Report. Summarize all the tasks, findings, conclusions, and recommendations of the commissioning process. Indicate the actual performance of the building systems in reference to the Owner's Project Requirements and contract documents. Include completed pre-functional inspection checklists, functional performance testing records, diagnostic monitoring results, identified deficiencies, recommendations, and a summary of commissioning activities.
8. O&M Submittals:
 - a. Training plan: Training plan shall include for each training session: dates, start and finish times, and locations; outline of the information to be presented; names and qualifications of the presenters; list of texts and other materials required to support training.
 - b. O&M Database.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. Instrumentation shall meet the following standards:
 1. Be of sufficient quality and accuracy to test and measure system performance within the tolerances required to determine adequate performance.
 2. Be calibrated on manufacturer recommended intervals with calibration tags permanently affixed to the instrument being used.
 3. Be maintained in good repair and operation condition throughout the duration of use on this Project.
- B. All standard testing equipment required to perform startup, initial checkout, and required functional performance testing shall be provided by Contractor for equipment tested.
- C. Data-logging equipment or software required to test equipment will be provided by the Commissioning Agent but shall not become the property of the Owner.

PART 3 - EXECUTION

3.1 COMMISSIONING PROCESS

- A. The following activities outline the commissioning tasks and the general order in which they occur. The Commissioning Agent shall coordinate all activities.
 1. Design Review and Documentation.
 - a. Documentation of Basis of Design and Owner Project Requirements.
 - b. Design Development Review.
 - c. Construction Document Review.
 2. Commissioning Scoping Meeting.

3. Commissioning Plan.
4. Submittals Review.
5. Start-Up/Pre-Functional Checklists.
6. Functional Performance Testing.
7. Deficiency Report and Resolution Record.
8. Operations and Maintenance Training:
 - a. O&M Manual.
 - b. Training.
 - c. O&M Database.
9. Record Documents Review.
10. Final Commissioning Report Documentation.
11. Deferred Testing:
 - a. Unforeseen Deferred Tests.
 - b. Seasonal Testing.
 - c. End-of-Warranty Review.

3.2 DESIGN REVIEW AND DOCUMENTATION

- A. Documentation of Basis of Design and Owner Project Requirements: Document basis of design and Owner Project Requirements as they relate to environmentally responsive characteristics, including: functionality, energy performance, water efficiency, maintainability, system cost, indoor environmental quality and local environmental impacts.
- B. Design Development Review: Review design documents to verify that each commissioned system meets the Owner Project Requirements.
- C. Construction Document Review: Review construction documents to verify that commissioning is adequately specified, that each commissioned system can be commissioned and is likely to meet the Owner Project Requirements.

3.3 COMMISSIONING SCOPING MEETING

- A. Commissioning Scoping Meeting:
 1. Schedule, coordinate, and facilitate a scoping meeting.
 2. Review each building system to be commissioned, including its intended operation, commissioning requirements, and completion and start-up schedules.
 3. Establish the scope of Work, tasks, schedules, deliverables, and responsibilities for implementation of the Commissioning Plan.
- B. Attendance: Commissioning team members.

3.4 COMMISSIONING PLAN

- A. Commissioning Plan: Develop a commissioning plan to identify how commissioning activities will be integrated into general construction and trade activities. The commissioning plan shall identify how commissioning responsibilities are distributed. The intent of this plan is to evoke questions, expose issues, and resolve them with input from the entire commissioning team early in construction.
 1. Identify who will be responsible for producing the various procedures, reports, Owner notifications and forms.
 2. Include the commissioning schedule.
 3. Describe the test/acceptance procedure.

3.5 SUBMITTALS REVIEW

- A. Submittal Review: Review the contractor submittals to verify that the equipment and systems provided meet the requirements of the Contract Documents and Owner Project Requirements.

3.6 START-UP/PRE-FUNCTIONAL CHECKLISTS

- A. Start-Up/Pre-Functional Checklists: Coordinate start-up plans and documentation formats, including providing contractor with pre-functional checklists to be completed during the startup process.
 - 1. Manufacturer start-up checklists and other technical documentation guidelines may be used as the basis for pre-functional checklists.
- B. Start-Up/Pre-Functional Checklist shall help verify that the systems are complete and operational, so that the functional performance testing can be scheduled.

3.7 FUNCTIONAL PERFORMANCE TESTING

- A. Functional Performance Testing: Test procedures shall fully describe system configuration and steps required for each test; appropriately documented so that another party can repeat the tests with virtually identical results.
 - 1. Test Methods: Functional performance testing and verification may be achieved by direct manipulation of system inputs (i.e., heating or cooling sensors), manipulation of system inputs with the building automation system (i.e., software override of sensor inputs), trend logs of system inputs and outputs using the building automation system, or short-term monitoring of system inputs and outputs using stand-alone data loggers. A combination of methods may be required to completely test the complete sequence of operations. The Commissioning Agent shall determine which method, or combination, is most appropriate.
 - 2. Setup: Each test procedure shall be performed under conditions that simulate normal operating conditions as closely as possible. Where equipment requires integral safety devices to stop/prevent equipment operation unless minimum safety standards or conditions are met, functional performance test procedures shall demonstrate the actual performance of safety shutoffs in a real or closely-simulated conditions of failure.
 - 3. Sampling: Multiple identical pieces of non-life-safety or non-critical equipment may be functionally tested using a sampling strategy. The sampling strategy shall be developed by the Commissioning Agent. If, after 3 attempts at testing the specified sample percentage, failures are still present, then all remaining units shall be tested at the contractors' expense.
- B. Develop functional performance test procedures for equipment and systems. Identify specific test procedures and forms to verify and document proper operation of each piece of equipment and system. Coordinate test procedures with the contractor for feasibility, safety, equipment, and warranty protection. Functional performance test forms shall include the following information:
 - 1. System and equipment or component name(s).
 - 2. Equipment location and ID number.
 - 3. Date.
 - 4. Project name.
 - 5. Participating parties.
 - 6. Instructions for setting up the test, including special cautions, alarm limits, etc.
 - 7. Specific step-by-step procedures to execute the test.

8. Acceptance criteria of proper performance with a Yes/No check box.
9. A section for comments.
- C. Coordinate, observe and record the results of contractor's functional performance testing.
 1. Coordinate retesting as necessary until satisfactory performance is verified.
 2. Verify the intended operation of individual components and system interactions under various conditions and modes of operation.

3.8 DEFICIENCY REPORT AND RESOLUTION RECORD

- A. Deficiency Report and Resolution Record: Document items of non-compliance in materials, installation, or operation.
- B. Non-Conformance. Non-conformance and deficiencies observed shall be addressed immediately, in terms of notification to responsible parties, and providing recommended actions to correct deficiencies.
 1. Corrections of minor deficiencies identified may be made during the tests at the discretion of the Commissioning Agent. In such cases the deficiency and resolution shall be documented on the procedure form.
 2. For identified deficiencies:
 - a. If there is no dispute on the deficiency and the responsibility to correct it:
 - 1) The Commissioning Agent documents the deficiency and the adjustments or alterations required to correct it. The contractor corrects the deficiency and notifies the Commissioning Agent that the equipment is ready to be retested.
 - 2) The Commissioning Agent reschedules the test and the test is repeated.
 - b. If there is a dispute about a deficiency or who is responsible:
 - 1) The deficiency is documented on the non-compliance form and a copy given to the Green Consultant.
 - 2) Resolutions are made at the lowest management level possible. Additional parties are brought into the discussions as needed. Contractor shall have responsibility for resolving construction deficiencies. If a design revision is deemed necessary and approved by Owner, Architect shall have responsibility for providing design revision.
 - 3) The Commissioning Agent documents the resolution process.
 - 4) Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency and notifies the Commissioning Agent that the equipment is ready to be retested. The Commissioning Agent reschedules the test and the test is repeated until satisfactory performance is achieved.
 3. Cost of Retesting: Costs for retesting shall be charged to the Contractor.

3.9 OPERATIONS AND MAINTENANCE TRAINING

- A. O&M Manual: Review the operation and maintenance manuals compiled by the contractor for completeness and for adherence to the requirements of the Specifications.
 1. Obtain additional materials from contractor as necessary to stress and enhance the importance of system interactions, troubleshooting, and long-term preventative maintenance and operation.
- B. Training: Develop a Training Plan. Coordinate and review the training programs for Owner's personnel.
 1. Obtain additional materials from contractor as necessary to stress and enhance the importance of system interactions, troubleshooting, and long-term preventative maintenance and operation.

- C. O&M Database: Develop a database from the O&M manual that contains the information required to start a preventative maintenance program.

3.10 RECORD DOCUMENTS REVIEW

- A. Record Documents: Review record documents to verify accuracy.

3.11 FINAL COMMISSIONING REPORT

- A. Final Commissioning Report: Compile final commissioning report. Summarize all of the tasks, findings, conclusions, and recommendations of the commissioning process.

3.12 DEFERRED TESTING

- A. Unforeseen Deferred Tests: If a test cannot be completed due to the building structure, required occupancy condition, or other deficiency, the functional testing may be delayed upon recommendation of the Commissioning Agent and the approval of the Owner. These tests are conducted in the same manner as the seasonal tests as soon as possible.
- B. Seasonal Testing:
 1. Schedule, coordinate, observe, and document additional testing for seasonal variation in operations and control strategies during the opposite season to verify performance of the HVAC system and controls. Complete testing during the warranty period to fully test all sequences of operation.
 2. Update O&M manuals and Record Documents as necessary due to the testing.
- C. End-of-Warranty Review: Conduct end of warranty review prior to the end of the warranty period. Review the current building operation with the facility maintenance staff. The review shall include outstanding issues from original or seasonal testing. Interview facility staff to identify concerns with building operation. Provide suggestions for improvements and assist owner in developing reports or documentation to remedy problems.
 1. Update O&M manuals and Record Documents as necessary due to the testing.

3.13 EQUIPMENT AND SYSTEM SCHEDULE

- A. The following equipment shall be commissioned in this Project.

System	Equipment	Check
HVAC System	Chillers (new and existing)	
	Pumps (new and existing)	
	Variable frequency drives (existing)	
	Air handlers (existing)	
	Hot water boilers and pumps (existing)	
	Terminal units	
	Exhaust fans	
Lighting Controls	Sweep or scheduled lighting controls	
	Daylight dimming controls	
	Lighting occupancy sensors	
Electrical	Panelboards (new and existing)	
	Emergency generator and controls (existing)	

BAS System		

END OF SECTION

SECTION 08 31 13 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Access doors and frames.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details material descriptions, dimensions of individual components and profiles, and finishes.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES

- A. Interior Flush GFRG Access Doors with Concealed Flanges:
 - 1. 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:
 - a. Williams Bros. Corporation of America (The).
 - 2. Description: Face of concealed-hinge door flush with frame, with concealed flange for gypsum board installation.
 - 3. Optional Features: Gasketing.
 - 4. Locations: Ceiling.
 - 5. Door Size: 24-inch x 24-inch.
 - 6. Door Type: Concealed-hinge, radius corner.
 - 7. Door and Frame Material: Unpainted glass-fiber-reinforced gypsum, with frames reinforced for hardware and fastenings.
 - 8. Latch and Lock: Cam latch, screwdriver operated.

2.2 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.
 - 1. For concealed flanges with drywall bead, provide edge trim for gypsum panels securely attached to perimeter of frames.

2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded-metal lath and exposed casing bead welded to perimeter of frames.
- D. Latch and Lock Hardware:
 1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.

2.3 FINISHES

- A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.
- B. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Suspension systems for interior ceilings and soffits.
 - 2. Grid suspension systems for gypsum board ceilings.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Notify manufacturer of damaged materials received prior to installation.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.2 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A641, Class 1 zinc coating, soft temper, 0.062-inch diameter wire, or double strand of 0.048-inch diameter wire.
- B. Wire Hangers: ASTM A641, Class 1 zinc coating, soft temper, 0.16-inch in diameter.
- C. Grid Suspension System for Gypsum Board Ceilings: ASTM C645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. 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:
 - a. USG Corporation.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordination with Sprayed Fire-Resistive Materials:
 - 1. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that are required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C754.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.
- E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING CEILING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- B. Suspend hangers from building structure as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - 4. Do not attach hangers to steel roof deck.

- 5. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
- 6. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- C. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- D. Installation Tolerances: Install suspension systems that are level to within 1/8-inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 09 22 16 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.
 - 3. Section 09 30 13 "Ceramic Tiling" for cementitious backer units installed as substrates for ceramic tile.

1.2 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Gypsum wallboard.
 - 2. Gypsum ceiling board.
 - 3. Acoustical sealant.

1.3 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.

1.4 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, 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, 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.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

- A. Manufacturers: Unless noted otherwise and subject to compliance with requirements, provide products by the following:
 - 1. American Gypsum.
 - 2. CertainTeed Corporation; Saint-Gobain North America.
 - 3. Georgia-Pacific Gypsum LLC.
 - 4. National Gypsum Company.
 - 5. USG Corporation.
- B. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Board, Type X: ASTM C1396.
 - 1. Thickness: 5/8-inch.
 - 2. Long Edges: Tapered.
- B. Gypsum Ceiling Board: ASTM C1396.
 - 1. Thickness: 1/2-inch.
 - 2. Long Edges: Tapered.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
 - 2. Shapes:
 - a. Cornerbead.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475.
- 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, rounded or beveled panel edges, 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.
 - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.

2.6 AUXILIARY MATERIALS

- A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
 - 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033- to 0.112-inch-thick.

- C. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- 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 INSTALLATION AND FINISHING OF PANELS, GENERAL

- A. Comply with ASTM C840.
- 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 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. 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-wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-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.
- I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: Vertical surfaces unless otherwise indicated.
 - 2. Ceiling Type: Ceiling surfaces.
- 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 horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - 3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLATION OF 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. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.

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, rounded or beveled edges, 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 C840:
 - 1. Level 4: At horizontal and vertical surfaces.
 - a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

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

SECTION 09 65 13 – PREFABRICATED RESILIENT COVE BASE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide prefabricated resilient cove base including but not limited to the following:
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM F710-08 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
 - 2. ASTM F1869-04 - Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate installation of prefabricated flash cove bases with resilient sheet flooring installation.
- B. Preinstallation Meetings: Arrange preinstallation meeting 1 week prior to commencing Work with all parties associated with trade as designated in Contract Documents or as requested by Architect. Presided over by Contractor, include Architect who may attend, Subcontractor performing Work of this trade, Owner's representative, testing company's representative, and consultants of applicable discipline. Review Contract Documents for Work included under this trade and determine complete understanding of requirements and responsibilities relative to Work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions on areas of work, and other matters affecting construction, to permit compliance with intent of Work of this Section.

1.4 SUBMITTALS

- A. Prefabricated Flash Cove Base Samples:
 - 1. Submit duplicate 12-inch-long samples of prefabricated flash cove bases.
 - 2. Ensure samples represent riser heights and toe widths specified, one completed inside corner and one completed outside corner with seams sealed and finished.
 - 3. Produce samples in specified flooring materials and selected colors.

1.5 CLOSEOUT SUBMITTALS

- A. Operational and Maintenance Data: Provide care and maintenance data for prefabricated flash cove bases for incorporation into Operations and Maintenance manual.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Extra Stock Materials: Deliver 10 feet in 10-foot lengths, of prefabricated flash cove bases for each color and type of flooring material used in the Work.

1.7 QUALITY ASSURANCE

A. Qualifications:

1. Installers: Ensure installers of prefabricated flash cove bases have a minimum of 5 years documented experience in installation of prefabricated flash cove bases and are certified by manufacturer as an "approved installer," having received necessary training from prefabricated flash cove base manufacturer. Submit documentation to Architect prior to commencement of Work of this Section.

1.8 DELIVERY, STORAGE AND HANDLING

A. Delivery and Acceptance Requirements: Deliver prefabricated flash cove bases in original packaging clearly labeled with Project information, flooring material, location, and other pertinent information clearly identified.

B. Storage and Handling Requirements:

1. Store materials flat on clean, dry floor area, away from construction activities to prevent damage.
2. Remove packaging prior to installation and allow prefabricated flash cove bases to acclimatize according to manufacturer's recommendations.

1.9 SITE CONDITIONS

A. Ambient Conditions: Maintain ambient air temperature at flooring installation area above 68 degrees F for a minimum of 72 hours prior to installation, during installation and for a minimum of 72 hours after installation. Temporary heat is not acceptable.

1.10 WARRANTY

A. Manufacturer Warranty: Warrant prefabricated flash cove base for lifetime against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to punctures through aluminum backing at cove radius provided prefabricated flash cove base was installed professionally in accordance with manufacturer's written specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Prefabricated Flash Cove Bases: Fabricated from same material and dye lots as resilient sheet flooring, in maximum practical lengths, with 1-1/2-inch x 1-1/2-inch formed aluminum reinforcing bonded to back of base material. Acceptable Product: "FlashCove™ Prefabricated Bases" by FlashCove™ Prefabricated Bases Inc.; www.flashcove.com and as follows:

1. Riser: 6 inches.
2. Toe: 6 inches.

B. Metal Base Cap: For adhesive installation; stainless steel cap; "chiklet" by FlashCove™ Prefabricated Bases Inc.; www.flashcove.com.

C. Prefabricated Flash Cove Base Adhesive: Low-VOC premium cove base adhesive recommended by both flooring and prefabricated flash cove base manufacturer.

- D. Concrete Moisture Emission Reducer: Provide one of following:
 - 1. "Poxycrete" by Duochem Inc.
 - 2. "Flextech 4010 Moisture Barrier" by Flextile Ltd.
 - 3. "Koester VAP I® 2000" by Koester American Corporation.
 - 4. "Sikafloor® 81 EpoCem" by Sika Corporation, USA.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Verify actual site dimensions and location of adjacent materials prior to commencing Work. Notify Architect in writing of any conditions which would be detrimental to the installation.
 - 2. Ensure concrete floor to receive resilient flooring and prefabricated flash cove base has been prepared in accordance with ASTM F710.
- B. Preinstallation Testing:
 - 1. In conjunction with flooring manufacturer written instructions.
- C. Evaluation and Assessment: Commencement of work implies acceptance of previously completed Work.

3.2 INSTALLATION

- A. Prefabricated Flash Cove Base Application:
 - 1. Provide prefabricated flash cove base for integral base indicated in Finish Schedule.
 - 2. Dry-fit prefabricated flash cove base; cut and fit material to required lengths. Miter-cut inside and outside corners.
 - 3. Dry-fit and cut metal cove cap prior to prefabricated flash cove base installation.
 - 4. Scribe glue line on walls and floor at edge of prefabricated flash cove base material.
 - 5. Apply adhesive in full spread (100 percent coverage on 2 surfaces) for full length of prefabricated flash cove base material. Apply prefabricated flash cove base to wall surface straight and level.
 - 6. Slide metal base cap behind prefabricated flash cove base material.
 - 7. Hand roll prefabricated flash cove base material onto wall and floor surface removing bumps, ripples and fishmouths. Remove excess adhesive.
 - 8. Heat weld seams (vertical and horizontal) in prefabricated flash cove base material.

3.3 PROTECTION

- A. Protect prefabricated flash cove bases from scratches, gouges, scuff marks, and other damage from time initial surface protection application until final inspection.

END OF SECTION

SECTION 09 65 20 – RUBBER SHEET FLOORING AND BASE

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Requirements:
1. Division 01 Specification Sections apply to Work of this Section.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials, and equipment necessary to complete the work of this Section, including but not limited to the following:
1. Resilient sheet flooring for commercial traffic with pre-applied adhesive.
 2. Resilient, sanitary base, and accessories.
 3. Substrate preparation.
- B. References (Industry Standards):
1. American Association of Textile Chemists and Colorists (AATCC):
 - a. AATCC 134 Electrostatic Propensity of Carpets.
 2. American National Standards Institute (ANSI):
 - a. ANSI ESD S97.2 Floor Materials and Footwear – Voltage Measurement on a Person.
 3. ASTM International (ASTM):
 - a. ASTM C518 Standard Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - b. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension.
 - c. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
 - d. ASTM D2240 Standard Test Method for Rubber Property – Durometer Hardness.
 - e. ASTM D3389 Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform, Double Head Abrader).
 - f. ASTM D6499 Standard Test Method for the Immunological Measurement of Antigenic Protein in Natural Rubber and its Products.
 - g. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - h. ASTM E648 Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
 - i. ASTM E662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
 - j. ASTM E1745 Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
 - k. ASTM E2179 Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors.
 - l. ASTM E2180 Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials.
 - m. ASTM F150 Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring.

- n. ASTM F155 Method of Test for Temper of Strip and Sheet Metals for Electronic Devices.
 - o. ASTM F386 Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces.
 - p. ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
 - q. ASTM F925 Standard Test Method for Resistance to Chemicals of Resilient Flooring.
 - r. ASTM F970 Standard Test Method for Static Load Limit.
 - s. ASTM F1344 Standard Specification for Rubber Floor Tile.
 - t. ASTM F1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring.
 - u. ASTM F1514 Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color.
 - v. ASTM F1515 Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change.
 - w. ASTM F1859 Standard Specification for Rubber Sheet Floor Covering Without Backing.
 - x. ASTM F1860 Standard Specification for Rubber Sheet Floor Covering With Backing.
 - y. ASTM F1861 Standard Specification for Resilient Wall Base.
 - z. ASTM F2055 Standard Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method.
 - aa. ASTM F2169 Standard Specification for Resilient Stair Treads.
 - bb. ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
 - cc. ASTM F2199 Standard Test Method for Determining Dimensional Stability of Resilient Floor Tile after Exposure to Heat.
 - dd. ASTM F3010 Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings.
 - ee. ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- 4. European Norm (FTM):
 - a. FTM 101 C 4046 Static Decay.
 - 5. International Organization for Standardization (ISO):
 - a. ISO 140 Measurement of sound insulation in buildings and of building elements.
 - 6. National Fire Protection Association (NFPA):
 - a. NFPA 253 Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source.
 - b. NFPA 258 Test Method for Specific Density of Smoke Generated by Solid Materials.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, installation guide, and maintenance guide for each material and accessory proposed for use.
- B. Samples: Submit 1 representative sample of each product specified for verification.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide resilient flooring manufactured by a firm with a minimum of 10 years' experience with resilient flooring of type equivalent to those specified.
 - 1. Manufacturer's quality management system must have ISO 9001:2000 approval.
 - 2. Provide resilient flooring products, including wall base, accessories, and subfloor preparation products from one manufacturer to ensure color matching and compatibility.
 - 3. Manufacturer shall be capable of providing technical training and technical field service representation.
- B. Installer Qualifications: Acceptable to manufacturer of resilient flooring or INSTALL (International Standards & Training Alliance) resilient certified for the requirements of the project.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's recommendations. Protect from damage due to weather, excessive temperatures, and construction operations.
- B. Deliver materials sufficiently in advance of installation to condition materials to the required temperature for 48-hours prior to installation.

1.6 PROJECT CONDITIONS

- A. The installation area must be fully enclosed, weather tight, and climate controlled between 63 degrees F and 75 degrees F and 40 percent to 60 percent ambient relative humidity (RH) for at least 48 hours prior, during and 72 hours after installation (do not use gas fueled blowers). Dew point must be avoided. The substrate must be at least 5 degrees F above dew point to be considered acceptable.

1.7 WARRANTY

- A. Provide manufacturer's standard limited warranty for wear, defect, bond, and conductivity.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Basis-of-Design: nora systems, Inc., 9 Northeastern Blvd., Salem, NH 03079; telephone 800.332.NORA or 603.894.1021; fax 603.894.6615.
- B. Rubber Sheet Floor Covering:
 - 1. Product Name: **noraplan environcare™ 3.0 mm, Article 1463**
 - 2. ASTM Specification: Type I
ASTM F1859 Standard
Specification for Rubber Sheet
Floor Covering Without Backing
 - 3. Limited Wear Warranty: 5 years

4. Material:	nora® vulcanized rubber compound 913 with environmentally compatible color pigments that are free of toxic heavy metals like lead, cadmium or mercury
5. Composition:	Homogeneous rubber compound with a random scattered design
6. Color:	As indicated on Interior Material Legend
7. Surface:	Smooth
8. Back of Sheet:	Double-sanded smooth
9. Material Dimensions (ASTM F1859):	39.37 feet by 48 inches (12m by 1.22m), ≥ amount specified
10. Thickness (ASTM F386): ± 0.006 inches (± 0.15mm) is required	0.12 inches (3mm)
11. Dimensional Stability (ASTM F2199): ≤ 0.15% in both directions is required	Meets requirements
12. Flammability (E648/NFPA 253): ≥ 0.45 watts/sq. cm for Class 1 is required	NBSIR 75 950, 1.03
13. Smoke Density (ASTM E662/NFPA 258): < 450 is required	NBS, 376 (flaming) and 256 (non-flaming)
14. CAN/ULC-S102.2:	Surface Burning, FSC1 of 125 and SD of 370
15. Burn Resistance:	Resistant to cigarette and solder burns
16. Slip Resistance (ASTM D2047): ≥ 0.5 is required	Static coefficient of friction, Neolite dry 0.92 Neolite wet 0.91 (not recommended for ramps)
17. Bacteria Resistance (ASTM E2180/ASTM G21):	Resistant to bacteria, fungi, and micro-organism activity
18. VOC's:	This flooring is GREENGUARD Gold Certified for Low VOC Emissions, Blue Angel Certified and CA 01350 compliant.
19. Latex Allergies (ASTM D6499):	Inhibition Elisa, results are below detection level
20. Sound Absorption (ASTM E2179/ISO 140):	Δ IIC 14, Δ Lw 10dB (compare only Δ values)
21. Sound Generation:	67.2 dBA, 68.9 dBC and 20.9 Sones, Independently tested
22. Hardness (ASTM D2240): ≥ 85 is required	Shore type "A", 92 achieved
23. Static Load (ASTM F970): ≤ 0.005 inches with 250 lbs. is required	Residual compression of 0.003 inches with 800 lbs.
24. Rolling Load Limit:	≤ 550 lbs. / sq. inch, with no forklift traffic

25. Abrasion Resistance (ASTM D3389): ≤ 0.035 oz. (1.0g) is required	1.1 lbs. (500g) load on H-18 wheel with 1000 cycles, 0.003 oz. (0.09g) weight loss
26. Elongation (ASTM D412): ≥ 300 lbs. per sq. inch is required	Modulus @ 10% is 1,299.0 lbs. per sq. inch
27. Oil & Grease Resistance:	No
28. Heat Resistance (ASTM F1514): Avg. ΔE ≤ 8.0 is required	Easily achieved with all batches and regular maintenance
29. Light Resistance: Avg. ΔE ≤ 8.0 is required	Easily achieved with all batches and regular maintenance
30. Static Generation (AATCC 134):	< 2000 Volts at 20% RH
31. Thermal Transmission (ASTM C518):	R-value of 0.04
32. Cleaning:	Cleaned and maintained effectively using water, nora® pads and a suitable cleaning machine, without the use of any factory and/or field-applied coatings. Also without using any chemicals that may be hazardous or containing any teratogenic, mutagenic or any other ingredients known to be carcinogenic. Refer to nora maintenance guides for product specific details.
33. Shine:	Higher shine achieved by buffing without any artificial topical applied coatings.
34. Substrate Preparation:	Per ASTM F710 and the nora® Installation Guide

2.2 ADHESIVES

- A. All rubber flooring adhesives shall be Nora NTX system.

PART 3 - GENERAL

3.1 GENERAL CONTRACTOR RESPONSIBILITIES

- A. Supply a safe, climate-controlled building and subfloor as detailed in the nora Installation Guide (available at www.nora.com/us).
- B. A subfloor that meets the requirements of ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring is required, or as detailed in the nora Installation Guide or nora® nTx Installation Guide as appropriate.
- C. A secure storage area that is fully enclosed, weather tight, and climate controlled between 63 degrees F and 75 degrees F and 40 percent to 60 percent ambient relative humidity (RH) for at least 48-hours prior and during the installation, so the flooring contractor can acclimate all materials.
- D. An installation area that is fully enclosed, weather tight, and climate controlled between 63 degrees F and 75 degrees and 40 percent to 60 percent ambient relative humidity (RH) for at least 48-hours prior, during, and 72-hours after installation (do not use gas fueled blowers). If this is not possible, contact the nora® Technical Department.

- E. Areas with direct prolonged exposure to sunlight should be protected with the use of Low E glass doors, windows or facades that reduce the UV transmissions to less than 1 percent.
- F. When using nora[®] nTx or nora[®] dryfix 750, the flooring can be trafficked immediately with no restrictions. All flooring must be protected from damage during construction operations using Masonite, plywood, or a similar product. Before laying the panels the flooring surface must be free of all debris. Lay panels so that they are edge to edge and tape the joints to prevent movement and debris entrapment. Inspect the flooring before covering and after removal for final acceptance.
- G. Conduct post-installation cleaning immediately for installations using nora dryfix 750 or nora nTx. Refer to the appropriate nora[®] Maintenance Guide for product specific details.

3.2 FLOORING CONTRACTOR RESPONSIBILITIES

- A. Prefabricated Flash Cove Base Application:
 - 1. Provide prefabricated flash cove base for integral base indicated in Finish Schedule.
 - 2. Dry-fit prefabricated flash cove base; cut and fit material to required lengths. Miter-cut inside and outside corners.
 - 3. Dry-fit and cut metal cove cap prior to prefabricated flash cove base installation.
 - 4. Scribe glue line on walls and floor at edge of prefabricated flash cove base material.
 - 5. Apply adhesive in full spread (100 percent coverage on 2 surfaces) for full length of prefabricated flash cove base material. Apply prefabricated flash cove base to wall surface straight and level.
 - 6. Slide metal base cap behind prefabricated flash cove base material.
 - 7. Hand roll prefabricated flash cove base material onto wall and floor surface removing bumps, ripples, and fishmouths. Remove excess adhesive.
 - 8. Heat weld seams (vertical and horizontal) in prefabricated flash cove base material.
- B. Provide trained installers that have at least one of the following:
 - 1. Approved by nora systems, Inc. or INSTALL (International Standards & Training Alliance) certified for the requirements of the Project.
 - 2. An effective installation manager to manage the project, installers, and ensure that all of the required procedures are followed as detailed in the nora Installation Guide (available at www.nora.com/us).
- C. Follow all requirements in the appropriate nora Installation Guide or nora nTx Installation Guide.

END OF SECTION

SECTION 09 72 16.16 - RIGID SHEET VINYL WALL COVERINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Hygenic wall coverings.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Division 22: Plumbing.
 - 3. Division 23: Heating, Ventilating, and Air Conditioning.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials. Class A.
 - 2. ASTM D 5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 "Administrative Requirements."
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Verification Samples: For each finish product specified, 2 samples, minimum size 6 inches square representing actual product, color, and patterns.
- D. Shop Drawings: Showing installation methods for transitions between wall and floor.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5-year experience manufacturing similar products.
- B. Installer Qualifications: Trained journeymen with a minimum of 3 years successful experience in the installation of wall coverings.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining Work until workmanship is approved by Architect.
 - 3. Remodel mock-up area as required to produce acceptable Work.

1.5 PRE-INSTALLATION MEETINGS

- A. Convene minimum 2 weeks prior to starting Work of this Section.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Store rolls of sheet goods in a secured upright position. Store materials in dry spaces protected from the weather, with ambient temperatures not less than 55 degrees F or more than 85 degrees F.
- C. Handle materials to avoid damage.

1.7 PROJECT CONDITIONS

- A. Temperature Requirements: If storage temperature is below 65 degrees F, the Altro Whiterock wall panel must be moved to a warmer place and allowed to reach this temperature before installation. For further information, refer to current Installation Guide.
- B. Maintain air temperature and structural base temperature at installation area between 65 degrees F and 80 degrees F for 48 hours before, during and 24 hours after installation.

1.8 SEQUENCING

- A. Ensure that products of this Section are supplied to affected trades in time to prevent interruption of construction progress.

1.9 WARRANTY

- A. Warranty: Provide manufacturer's standard limited warranty.

1.10 EXTRA MATERIALS

- A. Provide extra materials of product and adhesives in accordance with submittal requirements as specified in Division 01.
 - 1. Material of each color, pattern and type required for maintenance use from same production run as installed materials.
 - a. Quantity (sq. ft.): 10 feet – 0 inches x 8 feet – 0 inches.
 - 2. Clearly identify each wall panel and each container of adhesive.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Altro USA, Incorporated, 80 Industrial Way; Wilmington, MA 01887; Toll Free Tel: 800.377.5597; Tel: 978.657.6464; Fax: 610.746.4325; Email: [requestinfo \(support@altrofloors.com\)](mailto:requestinfo@altrofloors.com); Web: <http://www.altrofloors.com>
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 "Product Requirements."

2.2 HYGENIC WALL COVERINGS

- A. Basis of Design: Altro Whiterock Wall Designs High Quality Graphic Printed, as manufactured by Altro USA Incorporated. One-hundred percent pure vinyl, extruded, semi-rigid PVCu sheet containing no plasticizers or fillers. Hard coat protective layer is added to prevent damage to the graphics.
 - 1. Surface Burning Characteristics Compliance: CAN/ULC-S102 and ASTM E84.
 - 2. Impact resistance per ASTM D5420: 160 in-lbs.
 - 3. Thickness: 0.100-inch.
 - 4. Panel Dimensions (WxH): 48 inches x 118.11 inches.
 - a. Weight: 28.22 lbs.
 - 5. Color selection: Refer to Interior Material Legend.
 - 6. Accessories:
 - a. Altro Weld Rod: WSR. Color determined by Architect from manufacturer's selection.
 - b. Joint Strips: 2-Part-A831/30. 118 inches length. Color determined by Architect from manufacturer's selection.
 - c. Start and Edge Trim: 2-Part-A833/30. 118 inches length. Color determined by Architect from manufacturer's selection.
 - d. Polyurethane Adhesive: AltroFix W39. Two-part resin-based polyurethane adhesive. Default adhesive for most installations, suitable for wet area, non-climate-controlled areas, and non-absorbent surfaces.
 - e. Altro Sanitary Sealant: A803 clear. 10.5 oz. tube.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 - 1. Walls: Smooth and level. High points removed and low points filled with filler intended for the substrate and environmental conditions.
 - 2. Surfaces: Permanently dry and free from substances that may contribute to adhesive bond failure.
 - 3. Remove loose paint and conduct an adhesive bond test with paint.
 - 4. Dry Wall Substrates: Paint ready.
- B. Absorbent and porous substrates must have a proprietary sealer minimum of 12 hours prior to the installation.
- C. Electrical switches, power points etc., should be in a first fix installation state.
- D. Fitting to Door Frames: In place prior to installation wall covering.
- E. Complete painting in contact with wall covering. Sealant used at junctions is non-paintable.
- F. Clean surfaces thoroughly prior to installation.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent materials.
- B. All outside corners should be thermoformed per manufacturer's written installation instructions.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 09 91 23 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Steel.
 - 2. Cast iron.
 - 3. Galvanized metal.
 - 4. Wood.
 - 5. Gypsum board.
- B. Related Requirements:
 - 1. Divisions 01 Specification Sections apply to Work of this Section.
 - 2. Section 09 93 00 "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on interior wood substrates.

1.2 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D523, a matte flat finish.
- B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523, a high-side sheen flat, velvet-like finish.
- C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523, an eggshell finish.
- D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523, a satin-like finish.
- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523, a semi-gloss finish.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D523, a gloss finish.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
- C. Product List for each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. VOC content.

1.4 CLOSEOUT SUBMITTALS

- A. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

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 gallon of each material and color applied.

1.6 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect:
 - a. Vertical and Horizontal Surfaces: Provide samples minimum 4- by 4-foot (16 SF).
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacturer's label with the following information:
 - 1. Product name and type (description).
 - 2. Batch date.
 - 3. Color number.
 - 4. Environmental handling requirements.
 - 5. Surface preparation requirements.
 - 6. Application instructions.
- B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 degrees F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 degrees F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.
- C. Lead Paint: It is not expected that lead paint will be encountered in the Work.
 - 1. If suspected lead paint is encountered, do not disturb; immediately notify Architect and Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide PPG Architectural Finishes. Company products indicated or comparable product from one of the following:
 - 1. PPG Architectural Finishes, Inc.
- B. Source Limitations: Obtain paint materials from single source from single listed manufacturer.
 - 1. Manufacturer designations listed on a separate color schedule are for color reference only and do not indicate prior approval.

2.2 PAINT, GENERAL

- A. Standards: Provide products that comply with Manufacture's Premium 1st Quality standards indicated and like VOC limits.
- 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. Low-Emitting Materials: Interior paints and coatings shall comply with 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.
- D. Colors: As selected by Architect from manufacturer full range on Interior Material Legend.

2.3 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 2 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. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.
 - 1. Report, in writing, conditions that may affect application, appearance, or performance of paint.
- B. Substrate Conditions:
 - 1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - a. Wood: 15 percent.
 - b. Gypsum Board: 12 percent.
 - 2. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer 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 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. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.
- E. 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.
- F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

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.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following Work where exposed in equipment rooms:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.
 2. Paint the following Work where exposed in occupied spaces:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Other items as directed by Architect.
 3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 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.

3.6 INTERIOR PAINTING SCHEDULE

- A. Metal Substrates (Aluminum, Steel, Galvanized Steel):
 - 1. Water-Based Light Industrial Coating System:
 - a. Prime Coat: Primer, rust-inhibitive, water based: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, at 5.0 to 10.0 mils wet, 2.0 to 4.0 mils dry.
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based, semi-gloss, (Gloss Level 5): S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K46-151 Series, at 4.0 mils wet, 1.5 mils dry, per coat.
- B. Gypsum Board Substrates: Special Surgical Suite and Special Procedure Suite: Ceilings and any exposed walls.
 - 1. Water-Based Light-Industrial Coating System:
 - a. Prime Coat: Alkali-resistant, water-based primer.
 - 1) PPG Paints; Perma Crete 4-603XI, Interior Alkali Resistant Primer. Applied at a dry film thickness of not less than 1.4 Ó 2.6 mils. VOC <100 g/L.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, water-based, light-industrial coating, eggshell (Gloss Level 3).
 - 1) PPG Paints; Pitt-Glaze WB1 16-310 Series, Interior Pre-Catalyzed Acrylic Water-Borne Epoxy. Applied at a dry film thickness of not less than 1.5 mils. VOC <100 g/L.

END OF SECTION

SECTION 12 36 61.16 - SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid surface material countertops.
 - 2. Solid surface material backsplashes.
 - 3. Solid surface material end splashes.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 ACTION SUBMITTALS

- A. Product Data: For countertop materials and sinks.
- B. Shop Drawings: For countertops, show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.
- C. Samples: For each type of material exposed to view.

PART 2 - PRODUCTS

2.1 SOLID SURFACE COUNTERTOP MATERIALS

- A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.
 - 1. Manufacturers are subject to compliance with requirements. Provide products as indicated on Interior Material Legend.
 - 2. Colors and Patterns as indicated on Interior Material Legend.
- B. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.

2.2 COUNTERTOP FABRICATION

- A. Fabricate countertops according to solid surface material manufacturer written instructions and to the AWI/AWMAC/WI - Architectural Woodwork Standards.
 - 1. Grade: Custom.
- B. Configuration:
 - 1. Front: 1-1/2-inch laminated bullnose.
 - 2. Integrally-Formed Backsplash: Straight, slightly eased at corner.
 - 3. Integrally-Formed End Splash: Matching backsplash.
- C. Countertops: 1/2-inch-thick, solid surface material with front edge built up with same material.
- D. Integrally-Formed Backsplashes and End Splashes: 1/2-inch-thick, solid surface material.
- E. Joints: Fabricate countertops without joints.

2.3 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by solid surface material manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer.
- B. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
- C. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions.
- D. Install backsplashes and end splashes by adhering to wall and countertops with adhesive.
- E. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
- F. Apply sealant to gaps at walls; comply with Section 07 92 00 "Joint Sealants."

END OF SECTION

SECTION 21 13 00 - SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wet-pipe sprinkler system.
 - 2. System design, installation, and certification.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
- C. Scope of Work: Contractor is to modify existing fire sprinkler system to accommodate the new floor plan. Fire sprinkler heads shall match same type heads located in 1st floor operating rooms and shall match UMC standards. If existing fire sprinkler system contains flexible fire sprinkler head connections, then Contractor may utilize these as an acceptable connection method.

1.2 REFERENCES

- A. NFPA 13, 2002 Edition - Installation of Sprinkler Systems.

1.3 SYSTEM DESCRIPTION

- A. System to provide coverage for entire construction project. Refer to Plans.
- B. Provide system to NFPA 13, 2002 Edition. System designer to determine hazard for each room as by NFPA occupancy requirements. Submit sealed certification with sprinkler Drawings and calculations to TDSHS.
- C. Determine volume and pressure of incoming water supply from water flow test data. Contractor base the hydraulic calculations on site verified flow and pressure conditions.
- D. Interface system with main building fire and smoke alarm system.

1.4 SUBMITTALS

- A. Submit under provisions of Section 23 05 00 "General Mechanical Requirements."
- B. Shop Drawings: Indicate hydraulic calculations, detailed pipe layout, hangers and supports, components, and accessories. Indicate system controls.
- C. Product Data: Provide data on sprinkler heads, valves, and specialties, including manufacturer's catalogue information. Submit performance ratings rough-in details, weights, support requirements, and piping connections.
- D. Submit Shop Drawings, product data, hydraulic calculations to authority having jurisdiction for approval. Submit proof of approval to Engineer and local fire marshal.
- E. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds specified and code requirements.
- F. Submit fire sprinkler layout for review.

1.5 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 23 05 00 "General Mechanical Requirements."
- B. Record actual locations of sprinkler heads and deviations of piping from Drawings. Indicate drain and test locations.

1.6 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Section 23 05 00 “General Mechanical Requirements.”
- B. Maintenance Data: Include components of system, servicing requirements, Record Drawings, inspection data, replacement part numbers, availability, and location/numbers of service depot.

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with NFPA 13.
- B. Equipment and Components: Bear UL and FM label or marking.
- C. Maintain 1 copy of relevant document on site.

1.8 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this Section with minimum 3 documented years’ experience.
- B. Design sprinkler system under direct supervision of a Professional Engineer experienced in design of this Work and licensed in the State of Texas.
- C. Fire alarm system is to be installed by a licensed fire alarm contractor.

1.9 REGULATORY REQUIREMENTS

- A. Hydraulic calculations, product data, Shop Drawings: Bear stamp of approval of authority having jurisdiction. Submit sealed certification with sprinkler Drawing and calculations to TDSHS and local authority having jurisdiction.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and protect products to site under provisions of Section 23 05 00 “General Mechanical Requirements.”
- B. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.11 EXTRA MATERIALS

- A. Furnish under provisions of Section 23 05 00 “General Mechanical Requirements.”
- B. Provide extra sprinkler heads of each type under provisions of NFPA 13.
- C. Provide suitable wrenches for each head type.
- D. Provide metal storage cabinet in location designated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Central Sprinkler.
- B. Grinnel.
- C. Reliable Automatic Sprinkler.
- D. Viking.
- E. Substitutions: Refer to Section 23 05 00 “General Mechanical Requirements.”

2.2 SPRINKLER HEADS

- A. Suspended, Lay-In, and Gypboard Ceilings:
 - 1. Type: Standard concealed type with matching push on escutcheon plate.
 - 2. Head Finish: Chrome plated.
 - 3. Escutcheon Plate Finish: White plated.
 - 4. Fusible Link: Glass bulb type temperature rated for specific area hazard.
 - 5. Model: M-QR (Quick Response) Pendent Sprinkler by Viking or approved equivalent.
- B. Guards: Finish to match sprinkler head.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate Work of this Section with other affected Work.

3.2 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.
- B. Place pipe runs to minimize obstruction to other Work.
- C. Place piping in concealed spaces above finished ceilings.
- D. Center heads in 2 directions in ceiling tile and provide piping offsets as required.
- E. Apply masking tape or paper cover to ensure concealed sprinkler head cover plates do not receive field paint finish.
- F. Flush entire piping system of foreign matter.
- G. Hydrostatically test entire system.
- H. Require test be witnessed by authority having jurisdiction.

END OF SECTION

SECTION 21 13 00.20 - FIRE PROTECTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Pipe, fittings, valves, and connections for combination sprinkler and standpipe systems.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. ANSI/ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.
- B. ANSI/ASME B16.3 - Malleable Iron Threaded Fittings, Class 150 and 300.
- C. ANSI/ASME B16.4 - Cast Iron Threaded Fittings, Class 125 and 250.
- D. ANSI/ASME B16.5 - Pipe Flanges and Flanged Fittings.
- E. ANSI/ASME B16.9 - Factory-made Wrought Steel Buttwelding Fittings.
- F. ANSI/ASME B16.11 - Forged Steel Fittings, Socket-welding and Threaded.
- G. ANSI/ASME B16.18 - Cast Copper Alloy Solder-Joint Pressure Fittings.
- H. ANSI/ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- I. ANSI/ASME B16.25 - Buttwelding Ends.
- J. ANSI/ASME B36.10 - Welded and Seamless Wrought Steel Pipe.
- K. ANSI/ASME Sec 9 - Welding and Brazing Qualifications.
- L. ANSI/ASTM A135 - Electric-Resistance-Welded Steel Pipe.
- M. ANSI/ASTM A47 - Malleable Iron Castings.
- N. ANSI/ASTM B32 - Solder Metal.
- O. ANSI/AWS A5.8 - Brazing Filler Metal.
- P. ANSI/AWWA C110 - Ductile Iron and Gray Iron Fittings.
- Q. ANSI/AWWA C151 - Ductile Iron Pipe, Centrifugally Cast.
- R. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-coated Welded and Seamless.
- S. ASTM A120 - Pipe, Steel, Black and Hot-Dipped, Zinc-coated (Galvanized) Welded and Seamless, for Ordinary Uses.
- T. ASTM A234 - Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
- U. ASTM A795 - Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use.
- V. ASTM B75 - Seamless Copper Tube.
- W. ASTM B88 - Seamless Copper Water Tube.
- X. ASTM B251 - General Requirements for Wrought Seamless Copper and Copper-Alloy Tube.
- Y. ASTM D3309 - Polybutylene (PB) Plastic Hot- and Cold-Water Distribution Systems.
- Z. AWS D10.9 - Specifications for Qualification of Welding Procedures and Welders for Piping and Tubing.
- AA. NFPA 13 - Installation of Sprinkler Systems.

1.3 SUBMITTALS

- A. Submit under provisions of Section 23 05 00 “General Mechanical Requirements.”
- B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
- C. Product Data: Provide manufacturers catalogue information. Indicate valve data and ratings.
- D. Manufacturer's Field Report: Submit under provisions of Section 23 05 00 “General Mechanical Requirements.”
- E. Manufacturer's Field Report: Indicate time of start-up of treatment systems and include analysis of system water after cleaning and treatment.

1.4 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Section 23 05 00 “General Mechanical Requirements.”
- B. Maintenance Instructions: Include installation instructions, spare parts lists, procedures, and treatment programs.

1.5 QUALITY ASSURANCE

- A. Sprinkler Systems: Perform work to NFPA 13.
- B. Welding Materials and Procedures: Perform to ASME Code.
- C. Valves: Bear UL or FM label or marking. Provide manufacturer's name and pressure rating marked on valve body.
- D. Maintain 1 copy of each document on site.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products to site under provisions of Section 23 05 00 “General Mechanical Requirements.”
- B. Deliver and store valves in shipping containers, with labeling in place.
- C. Provide temporary protective coating on cast iron and steel valves.
- D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

PART 2 - PRODUCTS

2.1 SPRINKLER AND STANDPIPE PIPING, ABOVE GROUND

- A. Steel Pipe: ASTM A53; ASTM A120; ASTM A795; ANSI/ASTM A135; ASTM A795; ANSI/ASME B36.10; Schedule 40 black.
 - 1. Steel Fittings: ANSI/ASME B16.9, wrought steel, buttwelded; ANSI/ASME B16.25, buttweld ends; ASTM A234, wrought carbon steel and alloy steel; ANSI/ASME B16.5, steel flanges and fittings; ANSI/ASME B16.11, forged steel socket welded and threaded.
 - 2. Cast Iron Fittings: ANSI/ASME B16.1, flanges and fittings; ANSI/ASME B16.4, screwed fittings.

3. Malleable Iron Fittings: ANSI/ASME B16.3, screwed type. ANSI/ASTM A47.
4. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, C-shaped composition sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

2.2 BALL VALVES

- A. Up to and including 2 inches: Bronze 1- or 2-piece body, stainless steel ball, Teflon seats and stuffing box ring, lever handle, and balancing stops, solder or threaded ends with union.
- B. Over 2 inches: Cast steel body, chrome plated steel ball, Teflon seat and stuffing box seals, lever handle, flanged.

2.3 PIPE HANGERS AND SUPPORTS

- A. Conform to NFPA 13.
- B. Hangers for pipe sizes 1/2-inch to 1-1/2-inch: Malleable iron or Carbon steel, adjustable swivel, split ring.
- C. Hangers for pipe sizes 2 inches and over: Carbon steel, adjustable, clevis.
- D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

- A. Install piping in accordance with NFPA 13 for sprinkler systems.
- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, and not interfere with use of space and other Work.
- D. Route fire sprinkler piping as close to roof/above floor structure as possible.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- H. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply 1 coat of zinc rich primer to welding.
- I. Do not penetrate building structural members unless indicated.
- J. Provide sleeves when penetrating footings, floors, and walls. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.
- K. Die cut screw joints with full cut standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only.
- L. Install valves with stems upright or horizontal, not inverted. Remove protective coatings after installation.

- M. Provide ball or butterfly valves for shut-off or isolating service.
- N. Provide drain valves at main shut-off valves, low points of piping and apparatus.

END OF SECTION

SECTION 22 60 13 - MEDICAL GAS AND VACUUM SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Project Scope:
1. Contractor is to modify the existing medical boom medical gas piping systems to the Hybrid OR #8 and connect the new medical booms to the existing medical gas piping. Contractor will need to verify the exact locations of all medical gas piping above the ceiling. Zone valve box is existing with no anticipation of any medical gas work being required upstream of the existing zone valve box. Contractor will connect new medical booms/downstream piping to OR #8 to the existing medical alarm system. Contractor to replace any worn or non-operational medical gas sensors on the operating room side of the zone valve box as needed to provide a complete and operational system. Contractor is to coordinate all medical boom requirements with medical boom manufacturer, contracted by Owner, refer to new boom requirements on vendor provided documents.
- B. Section Includes:
1. Requires the furnishing of all equipment labor, materials, transportation, tools, and appliances and in performing all operations in connection with the installation of the medical gas systems including:
 - a. Oxygen.
 - b. Medical Air.
 - c. Medical Vacuum.
 - d. Nitrous Oxide.
 - e. WAGD.
 - f. Nitrogen.
 2. It shall be the Contractor's responsibility to furnish and install all equipment including the source to the end use including interconnecting piping for the medical gas systems, unless otherwise shown.
 3. Provide outlets, valve boxes, valves, alarm systems, pressure and vacuum switches, and miscellaneous accessories for complete systems.
 4. Pressure testing, cross connection testing, and final testing, including purging and analyzing. NOTE: At time of final TDSHS inspection, the oxygen supply system must be at a minimum of 50 psig shown on area medical gas alarm panel located in the hybrid operating room.
 5. Certification Procedure.
- C. Related Requirements:
1. Division 01 Specification Sections apply to Work of this Section.

1.2 WORK BY OTHERS

- A. Electrical wiring (of ceiling columns, alarms, and modular accessories) associated with system(s) shall be part of the electrical contract. Signal wiring and termination for master alarms will be responsibility of mechanical contractor.

1.3 REFERENCES

- A. NFPA - Pamphlet Number 56F.
- B. CGA – Pamphlet Number P-2.1.

1.4 SUBMITTALS FOR REVIEW

- A. Section 23 05 00 “General Mechanical Requirements”: Procedures for submittals. Contractor shall submit manufacturer’s data on all materials for medical gas systems.
- B. Product Data: Provide catalog illustrations of fixtures, equipment, sizes, and rough-in dimensions.

1.5 SUBMITTALS FOR INFORMATION

- A. Section 23 05 00 “General Mechanical Requirements”: Procedures for submittals.
- B. Manufacturer's Instructions: Indicate installation methods and procedures.

1.6 SUBMITTALS AT PROJECT CLOSEOUT

- A. Section 23 05 00 “General Mechanical Requirements”: Procedures for submittals.
- B. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
- C. Warranty: Submit manufacturer’s warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this Section with minimum 3 years documented experience.
- B. Installation shall comply with the National Fire Protection Association (NFPA) as set forth in latest edition of NFPA 99.
- C. Comply with local, state, and federal codes.
- D. All individuals engaged in installing medical gas piping systems in Texas shall have a medical gas endorsement issued by Texas State Board of Plumbing Examiners. Installers shall meet the requirements of NFPA 99 4-3.1.2.12 “Qualification of Brazing Procedures and Brazer Performance.”

1.8 COORDINATION

- A. Coordinate with others to ensure timely installations and to avoid conflicts and interference.
- B. Work with metal stud partition installer and/or mason to ensure anchors, sleeves and similar items are provided in sufficient time to avoid delays; chases and openings are properly sized and prepared.
- C. Coordinate layout of medical gas systems in spaces and identify piping in accordance to NFPA 99 Table 4-3.1.2.4.

1.9 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.10 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01 60 00 "Product Requirements": Transport, handle, store, and protect products.
- B. Accept fixtures on site in factory packaging. Inspect for damage.
- C. Protect installed equipment from damage by securing areas and by leaving factory packaging in place to protect fixtures.

1.11 WARRANTY

- A. Section 23 05 00 "General Mechanical Requirements."
- B. Warranty periods shall begin at Substantial Completion.

1.12 QUALIFICATION OF MANUFACTURER

- A. Pipeline System Components:
 - 1. One manufacturer shall supply the medical gas piping system(s) equipment to include outlets, valves and gauges, valve boxes, alarm boxes, nitrogen manifold system, oxygen, and nitrogen control cabinet.
 - 2. Manufacturer shall have a pipeline system engineer or product specialist available to check with the Contractor during installation of pipeline system equipment and provide a service organization to certify the system.
 - 3. Provide service support to the hospital after turnover. Factory trained service available within 200 miles of facility.

PART 2 - PRODUCTS

2.1 IN LINE VALVES (For Information Only)

- A. In line valve assemblies shall be located as shown on the piping plan and shall be full flow, double seal, ball type with bronze body, Buna-N seals, O-ring packing, chrome plated brass ball and designed for working pressures up to 300 psig. One-quarter turn of the handle shall operate the valve from the "open" to "closed" position. Valves shall be provided with Type K or L copper tube extensions for making connections to the pipe line. All valves shall be serviceable in the line and supplied clean and prepared for oxygen service. Color-coded gas identification labels shall be provided with each valve. Valves for each gas service shall be provided in each zone valve box, line size.
- B. In line shut-off valves shall be coordinated to match existing.

2.2 MEDICAL GAS PIPING

- A. Pipe shall be seamless Type K or L, (ASTM B819 specification) hard drawn seamless medical gas copper tubing or standard weight Schedule 40 brass pipe; ASTM B819 tubing is identified by the markings "OXY," "MED," "OXY/MED," "OXY/ACR," or "ACR/MED" in green (Type K) or Blue (Type L). Piping shall be pre-cleaned and plugged by supplier before shipment to job site. The installer shall furnish documentation certifying that all installed piping materials comply with the requirements of this paragraph.

- B. All pipe shall be pre-washed Type L seamless hard copper pipe assembled using cast brass, solder joint fittings. Joints shall be brazed using Sil Fos, and flux shall be Handy and Harmon Company's "Handy" flux, dry borax, or borax mixed with water. Borax and alcohol shall not be used. Where screw adapters must be used in connecting valves, outlets or other permanently connected equipment, the joint shall preferably be sealed by silver brazing, but where conditions do not permit it, or excessive heating might damage the valve or equipment, the joint may be made up with a thin coating of litharge and glycerin applied to the male thread only. Bends made with an approved bending device that will not appreciably flatten, buckle, or thin the wall of the tubing may be employed where conditions necessitate and where the radius of the bends exceeds 5 times the tube diameter.
- C. Before erection, all tubing, valves, and fittings except those supplied especially washed for oxygen service by the manufacturer shall be thoroughly cleaned of oil, grease, and other combustible materials by washing in a hot solution of sodium carbonate or trisodium phosphate (proportion of 1 pound to 3 gallons of water). Scrubbing shall be employed where necessary to insure complete cleaning. After washing, the materials shall be rinsed thoroughly with clean water. After cleaning, particular care must be exercised in the storage and handling of all tube and fittings, and in the condition of tools used in cutting or reaming to prevent contamination by oil or grease. Where such contamination has occurred, the items affected must be re-washed.
- D. The piping system shall be tested in accordance with NFPA 99 using dry nitrogen only.
- E. Extend medical gas piping to serve the new outlets shown on the Drawings. Provide shut-off valves (lockable) at point of connection to existing piping.

2.3 ALARM SYSTEM (Alarm System is Existing, Following for Information Only)

- A. The Contractor shall furnish and install the medical gas alarm system complete with remote switches, panels, tubing, etc. Wiring for the alarm shall be as specified under Division 26. Alarms shall be located as indicated on the Drawings. Refer to Electrical Drawings.
- B. Alarm Panel at existing Nurse Station: The medical gas and vacuum alarm shall be a closed circuit, self monitoring type. Alarm shall be used to monitor oxygen, vacuum, and air systems for pressure. A green NORMAL light will glow for all systems normal. If any abnormal condition signal is received from remotely mounted switches, the green light will go out and both an audible warning device will sound and the abnormal condition red light will come on. Provide 1 set of lights for each of 2 zone valve boxes. A switch shall be supplied to silence the warning device. However, the abnormal light shall remain on until the condition has been corrected. If 2 or more abnormal conditions occur, their condition will be indicated on the alarm panel until corrected. Only after all conditions have been corrected will the NORMAL light glow again. A test switch shall be supplied to test all internal circuits, light bulbs, and the audible warning device.
- C. The roughing-in box shall be extruded aluminum with flanges on all four sides for recessed installation and shall include an integral 115/24 volt transformer, terminal blocks, and protective plaster shield. The finishing coverplates shall be die cast with chrome plated border and black background, designed to provide 3/4-inch overplaster adjustment.
- D. The alarm system shall be of such design that 1, 2, or more monitors may be connected to a single pressure switch and all will work as described above. Alarm system shall comply with NFPA 56F requirements and qualify for NEC Class II signal systems (24 volts). The Multi-Signal Alarm Panel shall be listed by Underwriters' Laboratories, Inc.

- E. Alarm Legend:
 - 1. Oxygen line pressure low.
 - 2. Air line pressure low.
 - 3. Oxygen line pressure high.
 - 4. Air line pressure high.
 - 5. Vacuum line vacuum abnormal.

2.4 PIPE HANGERS AND SUPPORTS

- A. Install hangers and supports at maximum spacing in accordance with NFPA 99.
- B. Place hangers within 12 inches of each horizontal elbow.
- C. Use hangers with 1-1/2-inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
- D. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that walls and floor finishes are prepared and ready for installation of outlets.
- B. Verify that electric power is available and of the correct characteristics.

3.2 PRESSURE TESTING

- A. After installation of the piping and valves, but before installation of the service outlets, alarm actuating switches and gauges, the line shall be blown clear using oil-free dry air or nitrogen.
- B. Next, each section of the piping system shall be subjected to a test pressure of 1-1/2 times the maximum working pressure, but not less than 150 psig, with oil-free dry air or nitrogen. Then each joint shall be examined for leaks by means of soapy water or other means of leak detection safe for use with oxygen.
- C. All leaks shall be repaired and the section re-tested.
- D. After completing testing of each individual piping system, the medical gas systems shall be subjected to a pressure test at 1-1/2 times the maximum working pressure, but not less than 150 psig. The main line shut-off valve shall be closed during the test.
- E. After completion of the above test procedure, the finishing assemblies of station outlets, alarms, and components (that is, pressure switches, gauges, relief valves, etc.) shall be installed and all medical gas piping systems shall be subjected to a 24-hour standing pressure test at 20 percent above the normal operating line pressure. The main line shut-off valve shall be closed during this test.
- F. Leaks shall be located, repaired, and the system re-tested.
- G. To determine that no cross connection to other pipeline systems exists, reduce all systems to atmospheric pressure. Disconnect sources to test gas from the systems with the exception of the one system to be checked. Pressure this system with oil-free, dry air or nitrogen to a pressure of 50 psig. With appropriate adapters matching outlet labels, check each individual station outlet on systems installed to determine that test gas is being dispensed from only the outlets of this system.

- H. When medical gas piping systems have been tested, the source of test gas shall be disconnected and the proper gas source of supply connected to each system. Following connection and pressurization, outlets shall be opened in progressive order, starting nearest the source and completing the purge flushing at the outlet farthest from the source. Gas shall be permitted to flow from each outlet until each system is purged of test gas used during tests. After completion of purge flushing of the pipeline system, the outflow from each designated and labeled oxygen outlet station, anesthesia machine, and other oxygen dispensing equipment shall be tested (using an oxygen analyzer) to confirm the presence of the desired purity of oxygen.

3.3 CROSS CONNECTION TESTING AND CERTIFICATION

- A. Cross connection testing and certification of the medical gas system shall be performed by factory trained technicians from the medical gas pipeline equipment supplier.
- B. Medical gas system shall be tested in accordance with NFPA 99, latest edition.
- C. In addition to cross connection testing, the equipment manufacturer shall test each individual pipeline system component for performance to design specifications. Make necessary adjustments to ensure a complete and working system.
- D. Obtain and present to the Owner a complete bond report of pipeline certification from the equipment manufacturer. The letter of certification shall indicate:
 - 1. The system is free of crossed connections.
 - 2. System components perform to the manufacturer's design specifications.
- E. Medical Gas Warning System verification and certification is required per TDSHS.

3.4 INTERFACE WITH OTHER PRODUCTS

- A. Review millwork Shop Drawings. Confirm location and size of fixtures and openings before rough-in and installation.
- B. Field verify exact type and configuration of existing medical vacuum pump and medical air compressor systems prior to ordering/installing new pump and new compressor to expand both systems.

3.5 ADJUSTING

- A. Section 01 73 00 "Execution" and Section 01 77 00 "Closeout": Adjusting installed Work.

3.6 CLEANING

- A. Section 01 73 00 "Execution" and Section 01 77 00 "Closeout": Cleaning installed Work.
- B. Clean equipment.

3.7 PROTECTION OF FINISHED WORK

- A. Section 01 73 00 "Execution" and Section 01 77 00 "Closeout": Protecting installed Work.

3.8 INDEPENDENT CERTIFICATION

- A. Upon completion of manufacturer's certification, engage an independent agency which is licensed in the state of Texas to test medical gas piping to the nearest shut-off valve. Verification tests shall comply with Texas Department of Health, Hospital Licensing Rules Chapter 133. Provide written certification.

END OF SECTION

SECTION 23 05 00 - GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 DESCRIPTION

- A. Work covered by this Division shall consist of furnishing all labor, equipment, supplies, and materials and in performing all operations necessary for the installation of complete and operating mechanical systems as required by these Specifications and/or shown on the Drawings, subject to the terms and conditions of the Contract. The Work shall also include the completion of such mechanical and electrical details not mentioned or shown which are necessary for the successful operation of all systems described on the Drawings or required by these Specifications; this includes the furnishing all materials for the filling the systems to make them operable, including water, refrigerant, oil, and grease. Prove satisfactory operation of all equipment and controls to the Architect on request.
- B. Work Not Included: Certain labor, material, and equipment may be furnished and/or installed under other Divisions of these Specifications. This Contractor shall coordinate with other trades and arrange his Work to make the part fit together. The following items are to be accomplished under other Divisions of these Specifications:
 - 1. Temporary Heat: Refer to paragraph in this Section.
 - 2. Temporary Water and Toilet: Refer to General Conditions.
 - 3. Roof Curbs: Refer to paragraph in this Section.
 - 4. Electrical Equipment and Wiring: Refer to paragraph in this Section.
 - 5. Concrete: Refer to paragraph in this Section.
- C. Equipment Furnished by Owner: Rough-in services pipes to locations as required by Architectural and Mechanical Drawings and Equipment Shop Drawings. Provide service valves on all pipes except waste and vent pipes. Plug and cap all waste and vent pipes. Final Connection to equipment will be made by this Contractor.

1.3 BIDDING

- A. All mechanical equipment shall be new unless specified otherwise in the Specifications or on the Drawings.
- B. All Bids must be based only on the equipment and materials as scheduled on the Drawings and as specified or on equivalent equipment and materials from a pre-approved alternative manufacturer. No Bid may be based on a substituted or other alternative without specific written prior approval from the Architect. Any Contractor who assumes equivalence of products and who bases his Bid on that assumption does so at his own risk.
- C. A listing of approved alternative manufacturers does not mean that all products of a particular alternative manufacturer are acceptable alternative to the scheduled items; it merely means that for Bidding, prior approval is not required. All fixtures and devices must still be submitted according to the prescribed procedures. In addition, some items that have an important visual affect, e.g., electric water coolers, may be required to receive Owner's or Architectural approval also.

1.4 EXISTING UTILITIES AND CONDITIONS

- A. The Drawings indicate the locations, type, and sizes of various utilities within the site where known. These utilities are indicated as accurately as possible. If the Contractor encounters any utilities during construction which are not shown on the Drawings, they shall ask for written instructions from the Architect. Any relocation or remodeling required will then be directed by a Change Order. This Contractor shall assume all responsibility for protection of all utilities, shown or not, and for repair required by this construction at the Contractor's expense.
1. Contractor shall verify location, size, elevation, pressure, and any other pertinent data of the existing utilities. Additional costs incurred due to failure to verify such data and to coordinate associated Work with respective utility providers shall not be the Owner's responsibility but shall be borne by the Contractor.
 2. All costs associated with providing utilities including, but not limited to, connection fees, boring under roads, etc., shall be included in the Contractor's Bid price whether such costs are incurred by Contractor or charged by the utility company.
 3. Submission of a Bid by the Contractor shall be considered an acknowledgment by the Contractor of his compliance with this Section.
- B. The Contractor shall be thoroughly acquainted with details of the existing and new construction involved in this Project prior to submitting a Bid, as no allowances will be made because of the Contractor's unfamiliarity with these details. Portions of the existing plumbing, mechanical, and medical gas systems shall remain in use to serve existing areas as the various phases of the Work are completed. By actual site inspection of existing conditions as they relate to the various phases of Work, each Bidder shall determine those portions of the existing installations and systems which must be relocated, have temporary connections, or be avoided in order for new installations to be completed. Failure to become familiar with the magnitude and depth of Work to be performed on and to the various mechanical, plumbing, and medical gas systems will not relieve the Contractor of responsibility and can not be used as a basis for additional compensation.

1.5 CODES, PERMITS, AND FEES

- A. Contractor shall comply with all local, state, and national codes and shall pay for all applicable costs, fees, permits, licenses, and inspections for this Division.

1.6 DRAWINGS

- A. As required, the Contractor must prepare special drawings as called for herein and as directed by the Architect to coordinate the Work under each Section, to show conditions that interfere with installations, and to illustrate the adaptability of the equipment which the Contractor proposes to install. The drawings, prepared by the Contractor, shall be used in the field for the installation of the Work and 6 copies shall be submitted to the Architect for approval.
- B. The Division 23 Contractor shall prepare 1/4-inch = 1-foot – 0-inch scale drawings showing ductwork (supply, return, and exhaust), piping, medical gas, waste, vent, water, and all other plumbing. The drawings shall leave space for the installation of the fire protection system, lighting fixtures, and electrical conduits. The Division 23 Contractor shall determine the space required for the fire protection system and the electrical systems through direct discussion with the Division 26 Contractor and the fire protection subcontractor. The drawings shall show elevation markers, finished ceiling heights and structural members. Provide section views as required. Coordinate with Architect's reflected ceiling plan and the concrete floor for all penetrations as provided for in the Structural Drawings and Specifications. **THE MECHANICAL AND ELECTRICAL DRAWINGS ARE SCHEMATIC IN NATURE**

AND DO NOT SHOW ALL OFFSETS REQUIRED TO INSTALL ALL SYSTEMS. THE PURPOSE OF THESE DRAWINGS IS TO COORDINATE THE WORK TO BE INSTALLED FOR THE PROPER FITTING OF THE SYSTEMS INTO THE SPACE FOR ADEQUATE ACCESS BY THE OWNER FOR SERVICE AND MAINTENANCE OF SYSTEMS. THE ONUS IS ON THE CONTRACTOR TO FIT HIS WORK ABOVE THE CEILINGS WITH RESPECT TO THE PHASES DESCRIBED BY THE ARCHITECT ON REFLECTIVE CEILING PLANS, AND THESE DRAWINGS ARE A VEHICLE TO ACCOMPLISH THE REQUIREMENT.

- C. It is intended that anything, whether labor or materials, which is usually furnished as part of any equipment specified and which is necessary for operation, shall be furnished as part of the Contract without additional cost, whether or not shown or described.
- D. All piping in finished areas of the building shall be concealed except where otherwise noted on the Drawings.
- E. All equipment shall be installed in accordance with manufacturer's recommendations, unless approval is given in writing by the Architect for deviation.
- F. The mechanical and electrical Plans do not give exact details as to equipment, device, conduit, piping, duct, etc., elevations. The Plans do not show all offsets, elevation changes, and other installation details. The onus is on the Contractor to carefully lay out his Work at the site to conform to the existing and new architectural and structural conditions, to provide adequate installation clearances recommended by manufacturers, to provide proper slope of piping lines, and to avoid existing and new obstructions. The exact location of each piece of equipment and/or device shall be determined by measurements with reference to the Architectural Plans, detailed Shop Drawings, Equipment Drawings, or rough-in plans. Any minor adjustments in location necessitated by the existing conditions at the site or as directed by the Architect shall be made without any additional cost to the Owner. These steps must be conformed to by the Contractor to provide fully operational mechanical systems.
- G. The Contractor shall be responsible for the proper fitting of his material and apparatus into the space. Should the particular equipment which any Bidder proposes to install require other space conditions than those indicated on the Drawings, he shall arrange for such space with the Architect before submitting his Bid. Should changes become necessary on account of failure to comply with this clause, the Contractor shall make such necessary changes at Contractor expense.
- H. The Contractor shall submit working scale drawings of all his apparatus and equipment which in any way varies from these Specifications and Plans. These drawings shall be checked by the Architect before the Work is started and interferences with the structural conditions shall be corrected by the Contractor before the Work proceeds.
- I. Order of precedence shall be observed in laying out the pipe, ductwork, material, and conduit in order to fit the material into the space above the ceiling and in the chases and walls. The following order shall govern:
 - 1. Items affecting the visual appearance of the inside of the building such as lighting fixtures, diffusers, grilles, outlets, panelboards, etc. Coordinate all items to avoid conflicts at the site.
 - 2. Lines requiring grade to function such as sewers.
 - 3. Large ducts and pipes with critical clearances.
 - 4. Conduit, water lines, and other lines whose routing is not critical and whose function would not be impaired by bends and offsets.
- J. Piping, ducts, and conduits serving outlets on items of equipment shall be run in the most appropriate manner. Where the equipment has built-in chases, the lines shall be contained therein. Where the equipment is of the open type, the lines shall be run as close as possible to the underside of the top and in a neat and inconspicuous manner.

- K. Exceptions and inconsistencies in Plans and Specifications shall be brought to the Architect's attention before the Contract is signed. Otherwise, the Contractor shall be responsible for any and all changes and additions that may be necessary to accommodate his particular apparatus, material, or equipment.
- L. The Contractor shall distinctly understand that the Work described herein and shown on the accompanying Drawings shall result in a finished and working job and any item required to accomplish this intent shall be included whether specifically mentioned or not.
- M. Each Bidder shall examine the Plans and Specifications for the General Construction. If these Documents show any item requiring Work under Division 23 or 26, and that Work is not indicated on the respective "FP," "M," "P," and "E" Drawings, he shall notify the Architect in sufficient time to clarify before Bidding. If no notification is received, the Contractor is assumed to require no clarification and shall install the Work as indicated on the Drawings in accordance with the Specifications.

1.7 COORDINATION OF TRADES

- A. The General Contractor shall be responsible for resolving all coordination required between trades. For example, items furnished under Division 23 which require electrical connections shall be coordinated with Division 26 Contractor for:
 - 1. Voltage.
 - 2. Phase.
 - 3. Ampacity.
 - 4. No. and size of wires.
 - 5. Wiring Diagrams.
 - 6. Starter size, details, and location.
 - 7. Disconnect size and location.
 - 8. Control devices and details.
- B. The General Contractor shall coordinate with all sub-contractors to organize the ceiling space above operating rooms. Space is very limited, coordination drawings maybe required using the specific equipment to be installed by each sub-contractor, refer to Article 1.7 of this Section. There will be no additional allowance for relocating ductwork and/or piping installed without coordination in order to free ceiling space. The General Contractor shall verify that adequate space is available with all trades prior to installation of all equipment above the ceiling.
- C. Items furnished under various Sections which require plumbing connections shall be coordinated for services, pressures, size and location of connections, type of fuel, clearances for service, auxiliary devices required, etc.
- D. Items requiring insulation shall be fully insulated and that insulation shall be checked against manufacturer's directions and job requirements for suitability, coverage, thickness, and finish.
- E. Items installed in/on finished ceilings shall be coordinated with the ceiling construction. The Contractor under each Section shall conform to the reflected ceiling plan and shall secure details and/or samples of the ceiling materials as necessary to insure compatibility. Any device not conforming to this requirement shall be replaced by the Contractor at his expense.
- F. All items specified under Divisions 23 and 26 shall be installed tight, plumb, level, square, and symmetrically placed in relation to the work of other trades.

1.8 REQUIREMENTS OF REGULATORY AGENCIES

- A. The mechanical Work shall be performed in strict accordance with the local and state codes, ordinances, and regulations governing the particular Work involved. Furnish, without extra charge, any additional material and labor when and where required to comply with these Rules and Regulations, though the Work is not mentioned in the Specifications or shown on the Drawings. When the Specifications or Drawings call for or describe materials or construction of a better quality or larger sizes than required by the above mentioned Rules and Regulations, the provisions of these Specifications and accompanying Drawings shall take precedence.

1.9 QUALIFICATIONS

- A. All mechanics shall be capable journeymen, skilled in the Work assigned to them with licensing required by the inspecting authority. All welders must have been certified within the past 3 years to perform the Work which they are doing.

1.10 WARRANTY

- A. All materials and equipment shall be new unless otherwise specified.
- B. Guarantee all workmanship, material, and equipment and replace any found defective without cost to the Owner, for 1 year after final acceptance, as defined in General Conditions.
- C. Each warranty for longer than 1 year as described above (that comes with equipment used on the job) shall be passed into the Owner in the Operation and Maintenance Manual, along with the dates of start and end of warranty.
- D. Refer to General Conditions for additional information regarding specific warranty requirements.

1.11 PROJECT RECORD DOCUMENTS

- A. Before final payment, provide the Architect with 1 clean set of Drawings and Specifications corrected up-to-date as job progress. These Documents shall reflect the As-Built conditions. Refer to General Conditions for additional information.

1.12 SUBMITTALS

- A. The intent of this Section is to give general submittal information, refer to specific submittal information in the subsequent mechanical Sections. Refer to Specification Section 01 33 00 "Submittal Procedures" for further submittal procedure information.
- B. Sale of Electronic CADD Files:
 - 1. Refer to Architectural Specification Section 01 33 00 "Submittal Procedures" OR call the Parkhill office issuing this Project and request the pricing for electronic files.
- C. Within 10 days after award of the Contract, and before orders are placed, Contractor shall submit specific information on list of equipment and principal materials specified. Contractor shall indicate and/or provide names of manufacturers, catalog and model numbers, cut sheets, and such other supplementary information as necessary for evaluation.
- D. Requirements For Each Submittal:
 - 1. Provide all Division 23 submittals for Project in "pdf" format at one time. Refer to Section 01 33 00 "Submittal Procedures."
 - 2. Submittals must bear a dated stamp or specific written indication that the Contractor has reviewed and approved all submittal prior to submission to Architect.

3. Submittals must have all information deleted by Contractor that pertains to the means and methods of construction or to fabrication, assembly, installation, or erection (approval by Architect shall not extend to these areas unless specifically noted by Architect).
 4. SUBMITTALS MUST BE CLEARLY AND SPECIFICALLY MARKED AS TO WHICH SPECIFIC PIECE OF EQUIPMENT IS BEING SUBMITTED, BY USE OF A PERMANENT MARKER, STAMP, ETC., SO AS TO DISTINGUISH IT FROM OTHER PIECES OF EQUIPMENT THAT MAY OCCUR ON THE SAME PAGE.
 5. SUBMITTALS MUST BE CLEARLY MARKED AS TO WHICH AVAILABLE OPTIONS ARE BEING SUBMITTED THAT ARE ASSOCIATED WITH A PIECE OF EQUIPMENT, AND SUBMITTALS MUST BE COMPLETE WITH RESPECT TO QUANTITIES, DIMENSIONS, SPECIFIC PERFORMANCE, MATERIALS AND SIMILAR DATA TO ENABLE THE ARCHITECT TO REVIEW THE PROPOSED EQUIPMENT.
- E. **OMISSION BY CONTRACTOR OF ANY OF THE ABOVE REQUIREMENTS OR SUBMITTALS WILL SUBJECT SUBMITTAL TO AUTOMATIC REJECTION WITHOUT REVIEW.**
- F. Any submittals received by Architect that were not requested shall be returned without review of any kind.
- G. Installation Instructions: For certain products or systems as identified in subsequent Specifications Sections or on the Drawings, the Contractor shall be required to provide copies of manufacturer's installation instructions with the submittal. When required as such, the installation instructions are considered part of the submittal and their omission may result in automatic rejection of the submittal. Where more than 1 identical devices are scheduled, only 1 set of installation instructions needs to be submitted, e.g., if seven 5-ton split systems air conditions are scheduled, only one 5-ton unit installation instruction needs to be submitted. Similarly, if 1 set of installation instructions is identified by the manufacturer and on the instructions to be applicable to more than 1 type or size of devices, e.g., if 1 set of air conditioner instructions is good for 3-, 4-, 5-ton units, then only 1 instruction set is required for these devices.

1.13 SUBSTITUTED PRODUCTS

- A. Material or equipment specified by manufacturer's name is being used as a basis of standard. Substitution is allowable unless the manufacturer is listed on the Drawings or in the Specification as being not approved as an acceptable manufacturer.
- B. It shall be Contractor responsibility to verify that submitted substitute equipment will fit in space available. Contractor submittal for acceptance of the substitute shall include a written statement of whether or not such acceptance would require any subsequent or associated changes to the Drawings or Specifications. Any such changes shall be described in writing, briefly but complete.
- C. The Contractor shall be responsible for the costs of any such modifications due to substitution of materials or equipment for that which was specified or scheduled. The cost shall be complete, that is, it shall include the cost affect of any and all other trades.
- D. The Architect may request detailed Shop Drawing or plan layouts of mechanical rooms or systems of the substituted equipment.
- E. No electrical accommodations have been made for acceptable alternate manufacturers of any mechanical equipment. If an acceptable alternate manufacturer is selected, the onus is on the mechanical contractor to coordinate changes with the electrical contractor given Electrical Engineer approval.

1.14 SAFETY

- A. General: Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work, and Contractor shall comply with all laws governing safety, specifically the “Occupational Safety and Health Standards” and the “Safety and Health Regulations for Construction,” state and federal.
- B. According to OSHA, a hazardous chemical is any chemical, which is a physical hazard or a health hazard. This may include items such as paints, solvents, adhesives, sealants, cleaners, etc. If a contractor produces, uses, or stores hazardous chemicals at the workplace, then contractor shall develop, implement, and maintain a hazard communication program in compliance with the latest OSHA requirements. In projects with multiple tenants in which the building is partially occupied during all or part of the project, Contractor shall inform the building manager or Owner, according to OSHA guidelines, of any hazardous chemicals being produced, stored, or used in the building so that other tenants may be notified. Contractor shall employ required methods of training, information, handling, ventilation, labeling, storing, disposal, and removal of hazardous chemicals.

1.15 LABELING

- A. Each device for which an independent testing authority has established a standard shall have affixed a label indicating its compliance and listing. Refer to General Conditions for list of such independent testing authorities.

1.16 SITE VISIT REPORTS

- A. During the course of the job, the Architect will make site visits to observe Work in progress and will subsequently prepare a written site visit report, which will be sent to the Contractor and to whomever else the Architect desires. The Contractor shall prepare a written and typed response within 7 calendar days of his receiving the site visit report. The General Contractor shall include in his response the following information.
 - 1. Date of site visit by the Architect,
 - 2. Date of receipt of the site visit report,
 - 3. Name and title of the preparer of the response,
 - 4. An item number referenced to the site report,
 - 5. A brief 3 or 4 word description of the item,
 - 6. The Contractor or Subcontractor affected,
 - 7. The proposed course of action, and
 - 8. An expected time of completion of the action.

1.17 CUTTING AND PATCHING

- A. No joists, beams, girders, columns, slabs, or other structural elements shall be cut, drilled, or altered in any way by the Contractor without first obtaining written permission and instructions from the Architect.
- B. Where it is necessary to cut through any non-structural elements of walls, floors, or ceilings to permit the installation of any Work under this contract, or to repair any defects that may appear up to expiration of guarantee, such cutting shall be done by Contractor with as little damage as reasonably possible to the element being cut or to adjacent elements.

- C. After the necessary Work has been completed, the damage shall be repaired by the respective Contractor, who shall pay all costs of such cutting, repairs, and patching. All patching or sealing of cuts, penetrations, etc., including final appearance of same, shall be done to the approval of the Architect.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All materials shall be new and of specified quality, unless specifically noted otherwise. Materials shall be free from defects. Where manufacturer names are mentioned in the Specifications or on the Drawings, it has been done in order to establish a standard of quality and construction.
- B. Contractor will be responsible for transportation of his material to and from the job site, and will be responsible for the storage and protection of his materials and work until the final acceptance of the job. At the end of each day of work, each Contractor is responsible for covering or protecting his work and/or materials that may be susceptible to damage even if such damage is the result of unforeseen causes, e.g., an overnight thunderstorm. Failure to do so will be sufficient cause for rejection of any item in question, and any such item shall be replaced by Contractor at no cost to the Owner.
- C. Contractor shall verify that all pieces of equipment will fit through available openings in the building and that all equipment can be installed without modification of building structure.

2.2 EQUIPMENT SCHEDULE

- A. All equipment major items are specified in the equipment schedules on the Drawings and shall be new and furnished complete with all accessories normally supplied with the catalog item listed and all other accessories necessary for a complete and satisfactory installation.
- B. Equipment items so noted will require start-up by factory trained personnel. Equipment items so noted will require factory approved service personnel who shall provide all service, including all parts and all labor, as requested by the Owner, during the full period of equipment warranty.

2.3 EQUIPMENT RATINGS

- A. Equipment capacities as scheduled on the Drawings are at Project site altitude. Capacities of submitted equipment must be corrected for Project site altitude unless otherwise noted.

2.4 WORKMANSHIP

- A. The workmanship shall, in all respects, be of the highest grade, and all construction shall be done according to the best practices of the trade. Piping, ducting, and conduit shall be concealed unless otherwise noted, and installed square to the building lines. Any Work not meeting this requirement shall be replaced or rebuilt without extra expense to the Owner.

2.5 V-BELT DRIVES

- A. V-belt drives shall be of fabric and rubber construction of approved manufacture. Multiple belts shall be matched and all belts shall be adjusted to drive the apparatus properly and to prevent slippage and undue wear in starting motor nameplate rating.

2.6 BELTGUARDS

- A. The Contractor shall provide for each V-belt drive a painted steel belt guard, which shall be constructed around an angle iron frame, securely bolted to the floor or apparatus. The guard shall completely enclose drives and pulleys and be constructed to comply with all safety requirements. Hinged access doors not less than 6 x 6 inches shall be provided for access to motors and fan shaft for test purposes.

2.7 ELECTRICAL WIRING AND CONTROL EQUIPMENT

- A. All disconnects, motor starters, relays, wiring, etc. shall comply with all requirements of Division 26 electrical specifications.
- B. All Direct Digital Control (DDC) wiring and associated conduit and boxes, shall be provided under the Division 23 Sections of the Specifications. All control wiring, not identified under Division 23 DDC Specifications, shall be provided under Division 26. Division 26 requirements include power wiring for fire/smoke dampers and 120-volt power for mechanical equipment control equipment at all locations where required. It shall be the responsibility of the Electrical Contractor to coordinate for all locations requiring such power.
- C. **All electrical equipment characteristics (voltage, etc.) must be verified and corroborated with the electrical Drawings by the Division 23 Contractor prior to ordering. Voltage and phase characteristics MUST BE checked with the Electrical Drawings.**
- D. All motors shall be built in accordance with the current applicable IEEE, ASA, and NEMA standards. All general-purpose motors shall be open drip-proof machines for installation indoors and/or in protected locations. Totally enclosed fan cooled (TEFC) motors shall be used in all areas of exposure to weather or other environmental contamination. Motors shall be rated explosion-proof when located in hazardous atmospheres. Type II weather-protected motors may be used in lieu of TEFC motors on roof fan units and similar equipment. Motors mounted in direct sun shall be provided with a shield to forbid direct radiation from the sun when the sun is 45 degrees or greater above the horizon.
- E. Unless indicated otherwise, motors shall be NEMA design B with a service factor of 1.15 with 40 degrees C rise and total temperature rise of 65 degrees C ambient when powered from the system voltage feeding the motor. TEFC motors shall have a service factor of 1.00 with total temperature rise of 65 degrees C in the above conditions. Single-phase motors shall be NEMA Type N split phase induction motors with built-in thermal protectors. Single-phase motors connected on loads requiring high starting torque shall be capacitor-start induction motors.
- F. All motors shall be all copper wound, high power factor, high efficiency motors. Electric motors shall be an energy efficient type as defined in the latest edition of NEMA document no. MG1. Motor efficiency shall be made available to the Architect as required.

2.8 EQUIPMENT AND PIPING SUPPORTS

- A. All supporting systems for piping, equipment, and materials supported by the building structure shall be submitted to the Architect for approval prior to purchase and installation.
- B. Roof Curbs:
 - 1. Contractor shall provide and install Manufacturer supplied roof curbs for all roof mounted equipment.
 - a. Manufacturer's installation recommendations vary depending on roof types, but the Contractor is responsible for verifying the roof type and adhering strictly to the appropriate set of manufacturer's installation instructions.

2.9 ROOF PENETRATIONS

A. Piping:

1. Penetration shall be accomplished with factory-made assemblies designed specifically for the purpose. The use of pitch pans or pitch pockets is not allowed. Contractor shall provide a factory-made penetration assembly as follows:
 - a. For pipes, conduits, etc. up to 3 inches in diameter that can or are intended to be turned to horizontal after passing through the roof (e.g., small electrical conduit, gas piping, refrigerant lines, water pipes, etc.), the device shall consist of a curb assembly with a welded 18-gauge galvanized steel shell and base, 1-1/2 inches thick 3 pcf rigid insulation, 0.50-inch aluminum or 20-gauge galvanized cap with minimum 3-inch overhang and 1-inch rigid insulation, and 2- x 6-inch wood nailer. Product shall be Custom Curb Model CPC, ThyCurb Model RP-2 with TC-1, 2, or 3 curb, or approved equivalent.

B. General:

1. All roof flashing assemblies and roof curbs shall be closely coordinated with other Work through the Roofing Contractor to ensure that the flashing, canting, insulation type, and location, etc., is correct and appropriate for the particular roof construction type.
2. Each roof curb shall be selected and provided so that the top of the curb shall be level after installation. The curb shall provide a minimum clearance of 10 inches between the top of the finished roof surface and the top of the wood nailer, continuous around the curb perimeter.
3. Each roof penetration location shown on the Drawing is approximate. Refer to the Architectural and Structural Drawing for the structural openings. Refer to Cutting and Patching Section of this Specification for more information.
4. Provide each roof curb with other options as scheduled on the Drawings.

2.10 ACCESSIBILITY

A. Access Panels:

1. Access panels shall be provided wherever necessary for possible future replacement, adjustment, or maintenance of operating devices such as machinery, valves, dampers, switches, relays, etc., or to other critical non-operating devices such as pull boxes, inspection parts, gauges, etc. Such access panels shall be provided and installed by Contractor, whether or not shown on the Drawings, and shall be brought to the attention of the Architect for approval of type, color, etc. Where access is provided in rated members, the access panels shall be of a type that maintains the integrity of the member penetrated.

B. Access to Equipment:

1. All pipes, tubing, conduit, etc. including, but not limited to, draining piping of any type, electrical conduit, wiring not in conduit, and pneumatic control tubing shall be installed in such a way so as not to prevent and/or not to make difficult the removal, operation, use, or maintenance of equipment, access panels or doors, pathways (especially in attics or crawlspaces), observation ports, measurement or balancing devices and junction boxes.
2. If access for these purposes is prevented or made unreasonably difficult in the opinion of the Architect, then the Contractor shall make modifications or repairs at no cost to anyone except the Contractor. Such modifications or repairs shall be considered neither complete nor adequate until the Architect is satisfied that access for the above purpose is achieved.

2.11 PROTECTION OF PENETRATION

- A. All penetrations of fire or smoke barriers shall be sealed, sleeved (if any), insulated (if any), and vibration isolation (if any) that it maintains the fire or smoke resistance of the barrier in accordance with the latest edition of NFPA 101 Life Safety Code.
- B. Contractor shall verify locations and type of all partitions penetrations from the Drawings. Sealing material and methods shall be per UL recommendations.

PART 3 - EXECUTION

3.1 STORAGE

- A. Provide for proper storage of all materials and equipment and assume responsibility for losses due to any cause. All storage shall be within the Contract limits of the building site or in a bonded warehouse. All equipment and materials must be covered and stored out of the elements; any item, which has become rusted, will not be permitted to be used.
- B. Each Contractor shall provide temporary storage facilities suitable for equipment stored at the job site. Storage facilities shall be rainproof and lockable as required. Materials or equipment stored on site but not in a lockable rainproof storage facility shall be stored above ground or above slab. Contractor shall take necessary precautions to prevent entry of and/or damage from dirt, trash, water, or vermin. Equipment not properly stored and protected shall be, at the discretion of the Architect, replaced at no cost to the Owner. Roofs are not acceptable storage areas unless specifically allowed in writing by the Architect.

3.2 INSTALLATION AND ARRANGEMENT

- A. Install all Work to permit removal (without damage to other parts) of coils, heat exchanger bundles, boiler tubes, fan shafts and wheels, filters, belt guards, sheaves and drives, and all other parts which might require periodic replacement or maintenance. Arrange pipes, ducts, and equipment to permit ready access to valves, traps, starters, motors, control components and to clear opens of doors and of access panels.
- B. Offsets, transitions, and changes in direction in pipes and ducts shall be made as required to maintain proper head room and pitch of sloping pipes whether or not indicated on the Drawings. Furnish and install all traps, air vents, sanitary vents, etc., as required to affect these offsets, transitions, and changes in direction.

3.3 PROTECTION OF WORK AND PROPERTY

- A. Where there are existing facilities, be responsible for protection thereof, whether or not such facility is to be removed or relocated or remain as installed. Moving or removing any facility must be done so as not to cause interruption the Work or Owner's Operation.
- B. All pipe and duct openings shall be closed with caps or plugs during installation. All fixtures shall be covered and protected against injury. At final completion, all work shall be cleaned and delivered in an unblemished condition or refinished and repainted at the desecration of the Architect.

3.4 CONCEALED AND EXPOSED WORK

- A. “Concealed” is intended to mean within such spaces as pipe chases, pipe trenches, above plaster ceilings, in walls and buried pipe is inaccessible when building is completed. “Exposed” is intended to be within equipment rooms, unfinished spaces, above “pushup” ceilings, accessible pipe tunnels, etc., where pipe is accessible.

3.5 FIELD MEASUREMENTS

- A. The Contractor shall verify the dimensions and conditions governing Work at the Project site. He shall examine adjoining Work on which his Work is dependent, for perfect efficiency, and shall report any Work, which must be corrected.

3.6 LUBRICATION

- A. The Contractor shall provide all oil and grease for the operating of all equipment until acceptance. The Contractor shall be held responsible for all damage to bearings while the equipment is being operated by him up to the date of acceptance of the equipment. The Contractor shall protect all bearings and shafts during installation and shall thoroughly grease the steel shafts to prevent corrosion.

3.7 MANUFACTURER'S DIRECTION

- A. The Contractor shall install all equipment in strict accordance with all directions and recommendations furnished by the manufacturer. Where such directions are in conflict with the Plans and Specifications, the Contractor shall report such conflicts to the Architect who shall make changes deemed necessary and desirable.

3.8 FLUSHING, CLEANING, AND STERILIZING

- A. Before final connections are made in the piping systems, all piping shall be blown out with air and then completely washed out with cleaning compounds. The systems shall be flushed for complete removal of all foreign materials. Furnish all temporary connections, valves, etc., required for this purpose.
- B. After flushing, sterilize the domestic water systems with an approved chlorinating agent to provide a dosage on not less than 50 ppm. After minimum contact period of 8 hours, the system shall be flushed with clean water until the residual chlorine is no greater than the city water.

3.9 TESTS

- A. Test fire protection at 200 psig. Test to be held for a minimum of 6 hours.
- B. Test all (medical, natural, etc.) gas lines under 60 psig air pressure. Test to be held for a minimum of 6 hours.
- C. All tests shall be witnessed and approved by the Architect or the local authority having jurisdiction before covering or insulating. The satisfactory operation of blowers, pumps, and other equipment with moving parts shall be demonstrated to the Architect. Equipment without movable parts shall have pressure or other tests performed by the Contractor to demonstrate satisfactory operation.
- D. Furnish all instruments, pumps, blowers, and equipment required for the testing.
- E. Provide written copies of these test reports for inclusion on the Operations and Maintenance Manuals.

3.10 PAINTING

- A. Surfaces of all equipment and material not provided with a factory finish coat shall be thoroughly cleaned, primed (if not factory primed) and finish coated with a high quality alkyd industrial enamel of a color chosen by the Owner.

3.11 SPECIAL OPENINGS

- A. The Contractor shall attempt to schedule delivery of all large equipment requiring special openings for installation prior to enclosing of area. Where this is not possible written notice of required openings which must be provided shall be listed by size and location and submitted to the General Contractor prior to enclosing of areas involved. Work required to construct openings and the associated cost of enclosing them shall be done at no additional cost to the Owner.

3.12 PLACING IN OPERATION

- A. All ducts, pipes, equipment, controls, etc., shall be cleaned of plaster and other foreign debris.
- B. Before final acceptance, all strainers shall be thoroughly cleaned or replaced, all bearings shall be oiled or greased, and all drains shall be cleaned out and primed. All permanent filters shall be cleaned; throwaway type filters shall be replaced with new filters.
- C. The systems shall be placed in operation.
- D. The contractor shall verify that all controls are set to meet operating conditions specified.
 - 1. Example: Boiler operating control set at 200 degrees F. Limit control set at 220 degrees F.
- E. The Contractor shall verify that all pieces of equipment are operable and that all sequence of controls are being met.
- F. Contractor to adjust seating through the first year as required by Architect.

3.13 BALANCING, TESTING, AND ADJUSTING THE MECHANICAL SYSTEMS

- A. Balancing the mechanical systems shall be part of this Contract, refer to subsequent mechanical Specification Section for details. This Contractor is to include in their Bid the cost of balancing, testing, and adjusting.

3.14 OPERATION AND MAINTENANCE INSTRUCTIONS

- A. Contractor shall prepare and provide 4 copies of operating and maintenance manuals. Contractor shall deliver 4 bound sets to the Architect for approval. Each manual shall be in a ring binder and shall be indexed with dividers for each section. Delivery of required documents is a condition of final acceptance.
- B. Each manual shall contain, but not limited to, the following general sections:
 - 1. Certificates of acceptance from the inspecting authorities,
 - 2. Waiver of all liens,
 - 3. Warranties with starting dates and end dates for each pieces of equipment and/or for each system (warranties shall begin on date of substantial completion and acceptance by the Owner),
 - 4. Names, telephone and fax numbers and addresses of all subcontractors, vendors, manufacturer's representatives, and warranties providers,
 - 5. Certification letters from each Contractor that each system furnished and installed by that Contractor and/or subcontractors is started-up, balanced, adjusted, and checked for proper operation in accordance with the intent of the Contract Documents,

6. Spare parts lists for each piece of equipment,
 7. Lubrication charts showing type of lubrication and application methods and frequencies,
 8. Filter cleaning or replacement schedule (On Contractor's letterhead stationery),
 9. Preventative maintenance schedule for checking all items such as belt drives, safety controls, oil and refrigerant charges, and seasonal changer over recommendations. Cleaning of all strainers, traps, coils, tower pans, tubes, sprays, etc. (on Contractor's letterhead stationery),
 10. Water treatment recommendations and instructions for boiler, chillers, etc. Provide necessary water treatment chemicals as required for initial start-up. Coordinate with Owner to supplement and/or modify existing water treatment chemicals to allow for new equipment.
 11. Normal operating instructions including a sequence of operations (on Contractor's letterhead stationery),
 12. Instructions as to procedures to be followed for emergency situations, such as alarms or safety items being tripped. (on Contractor's letterhead stationary),
 13. Instruction on who to call for service during guarantee period, (on Contractor's letterhead stationery),
 14. Approved copy of the Testing, Adjusting, and Balancing Reports,
 15. Copies of As-Built Drawings on reproducible vellum as produced by a Xerox or photographic process and,
 16. Copies of all approved Shop Drawing submittals including nameplate date, design parameters, name, telephone and fax numbers, address of vendor, manufacturer's representative, and warrantee provider.
- C. **APPROVAL WILL NOT BE GIVEN FOR FINAL PAYMENT UNTIL THE TESTS, AS BUILT DRAWINGS, BALANCING AND OPERATING INSTRUCTION PORTIONS HAVE BEEN COMPLETED.**

3.15 INSTRUCTIONS TO THE OWNER

- A. Contractor shall instruct the Owner's operating personnel in the operations and maintenance of all mechanical systems and equipment. There shall be a minimum of 4 hours of training. Contractor shall furnish any special servicing tools required for maintenance.
- B. Contractor shall conduct a demonstration of the installation upon completion and final acceptance of the Work. There shall be a minimum eight-hour demonstration. Prior to this all Work shall have been completed, tested, balanced, and placed in operation. Qualified personnel must be present at the demonstration to operate all the systems and prove the performance of the equipment. The schedule for this demonstration shall be coordinated with the Architect.

END OF SECTION

SECTION 23 05 00.20 - BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. The following basic mechanical materials and methods to complement other Division 23 Sections:
 - a. Piping materials and installation instructions common to most piping systems.
 - b. Concrete equipment base construction requirements.
 - c. Equipment nameplate data requirements.
 - d. Labeling and identifying mechanical systems and equipment is specified in Section 23 05 53 "Mechanical Identification."
 - e. Nonshrink grout for equipment installations.
 - f. Field-fabricated metal and wood equipment supports.
 - g. Installation requirements common to equipment Specification Sections.
 - h. Cutting and patching.
 - i. Touchup painting and finishing.
 - 2. Pipe and pipe fitting materials are specified in piping system Sections.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 DEFINITIONS

- A. Pipe, pipe fittings, and piping include tube, tube fittings, and tubing.
- B. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below the roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.
- C. Exposed Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- D. Exposed Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- E. Concealed Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
- F. Concealed Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.3 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 01 Specification Sections.
- B. Product data for following piping specialties:
 - 1. Mechanical sleeve seals.
- C. Samples of color, lettering style, and other graphic representation required for each identification material and device.
- D. Coordination drawings for access panel and door locations.

- E. Prepare coordination drawings according to Section 01 33 00 "Submittal Procedures" to a 1/4-inch equals 1 foot (1:48) scale or larger. Detail major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Show space requirements for installation and access. Show where sequence and coordination of installations are important to the efficient flow of the Work. Include the following:
1. Proposed locations of piping, ductwork, equipment, and materials. Include the following:
 - a. Planned piping layout, including valve and specialty locations and valve stem movement.
 - b. Planned duct systems layout, including elbow radii and duct accessories.
 - c. Clearances for installing and maintaining insulation.
 - d. Clearances for servicing and maintaining equipment, including space for equipment disassembly required for periodic maintenance.
 - e. Equipment service connections and support details.
 - f. Exterior wall and foundation penetrations.
 - g. Fire-rated wall and floor penetrations.
 2. Scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
 3. Floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
 4. Reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.

1.4 QUALITY ASSURANCE

- A. Qualify welding processes and operators for piping according to ASME "Boiler and Pressure Vessel Code," Section IX, "Welding and Brazing Qualifications":
1. Comply with provisions of ASME B31 Series "Code for Pressure Piping."
 2. Certify that each welder has passed AWS qualification tests for the welding processes involved and that certification is current.
- B. ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.
- C. Equipment Selection: Equipment of greater or larger power, dimensions, capacities, and ratings may be furnished provided such proposed equipment is approved in writing and connecting mechanical and electrical services, circuit breakers, conduit, motors, bases, and equipment spaces are increased. No additional costs will be approved for these increases if larger equipment is approved. If minimum energy ratings or efficiencies of the equipment are specified, the equipment must meet the design requirements and commissioning requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pipes and tubes with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.
- B. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. When stored inside, do not exceed structural capacity of the floor.
- C. Protect flanges, fittings, and piping specialties from moisture and dirt.
- D. Protect stored plastic pipes from direct sunlight. Support to prevent sagging and bending.

1.6 SEQUENCING AND SCHEDULING

- A. Coordinate mechanical equipment installation with other building components.
- B. Arrange for chases, slots, and openings in building structure during progress of construction to allow for mechanical installations.
- C. Coordinate the installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
- D. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning prior to closing in the building.
- E. Coordinate connection of electrical services.
- F. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.
- G. Coordinate requirements for access panels and doors where mechanical items requiring access are concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section "Access Doors and Frames."
- H. Coordinate installation of identifying devices after completing covering and painting where devices are applied to surfaces. Install identifying devices prior to installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 PIPE AND PIPE FITTINGS

- A. Refer to individual piping system specification Sections for pipe and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

- A. Refer to individual piping system Specification Sections in Division 23 for special joining materials not listed below.
- B. Pipe Flange Gasket Materials: Suitable for the chemical and thermal conditions of the piping system contents:
 - 1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness, except where thickness or specific material is indicated:
 - a. Full-Face Type: For flat-face, Class 125 cast-iron and cast-bronze flanges.
 - b. Narrow-Face Type: For raised-face, Class 250 cast-iron and steel flanges.
 - 2. ASME B16.20 for grooved, ring-joint, steel flanges.
 - 3. AWWA C110, rubber, flat face, 1/8-inch thick, except where other thickness is indicated; and full-face or ring type, except where type is indicated.
- C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, except where other material is indicated.
- D. Solder Filler Metal: ASTM B32:
 - 1. Alloy Sn95 or Alloy Sn94: Tin (approximately 95 percent) and silver (approximately 5 percent), having 0.10 percent lead content.
- E. Brazing Filler Metals: AWS A5.8:
 - 1. BCuP Series: Copper-phosphorus alloys.
 - 2. BAg1: Silver alloy.

- F. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- G. Plastic Pipe Seals: ASTM F477, elastomeric gasket.
- H. Flanged, Ductile-Iron Pipe Gasket, Bolts, and Nuts: AWWA C110, rubber gasket, carbon steel bolts and nuts.
- I. Couplings: Iron body sleeve assembly, fabricated to match outside diameters of plain-end pressure pipes:
 - 1. Sleeve: ASTM A126, Class B, gray iron.
 - 2. Followers: ASTM A47 (ASTM A47M), Grade 32510 or ASTM A536 ductile iron.
 - 3. Gaskets: Rubber.
 - 4. Bolts and Nuts: AWWA C111.
 - 5. Finish: Enamel paint.

2.3 PIPING SPECIALTIES

- A. Escutcheons: Manufactured wall, ceiling, and floor plates; deep-pattern type where required to conceal protruding fittings and sleeves:
 - 1. Inside Diameter: Closely fit around pipe, tube, and insulation.
 - 2. Outside Diameter: Completely cover opening.
 - 3. Cast Brass: 1-piece, with setscrew.
 - a. Finish: Rough brass.
 - b. Finish: Polished chrome plate.
 - 4. Cast Brass: Split casting, with concealed hinge and setscrew.
 - a. Finish: Rough brass.
 - b. Finish: Polished chrome plate.
 - 5. Cast-Iron Floor Plate: 1-piece casting.
- B. Dielectric Fittings: Assembly or fitting having insulating material isolating joined dissimilar metals to prevent galvanic action and stop corrosion.
 - 1. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld neck end types and matching piping system materials.
 - 2. Insulating Material: Suitable for system fluid, pressure, and temperature.
 - 3. Dielectric Unions: Factory-fabricated, union assembly for 250-psig minimum working pressure at a 180 degrees F temperature.
 - 4. Dielectric Flanges: Factory-fabricated, companion-flange assembly for 150- or 300-psig minimum pressure to suit system pressures.
 - 5. Dielectric-Flange Insulation Kits: Field-assembled, companion-flange assembly, full-face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
 - a. Provide separate companion flanges and steel bolts and nuts for 150- or 300-psig minimum working pressure to suit system pressures.
 - 6. Dielectric Couplings: Galvanized-steel coupling, having inert and noncorrosive, thermoplastic lining, with threaded ends and 300-psig minimum working pressure at 225 degrees F temperature.
 - 7. Dielectric Nipples: Electroplated steel nipple, having inert and noncorrosive thermoplastic lining, with combination of plain, threaded, or grooved end types and 300-psig working pressure at 225 degrees F temperature.
- C. Mechanical Sleeve Seals: Modular, watertight mechanical type. Components include interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve. Connecting bolts and pressure plates cause rubber-sealing elements to expand when tightened.

- D. Sleeves: The following materials are for wall, floor, slab, and roof penetrations:
1. Steel Sheet Metal: 24-gauge or heavier galvanized sheet metal, round tube closed with welded longitudinal joint.
 2. Steel Pipe: ASTM A53, Type E, Grade A, Schedule 40, galvanized, plain ends.
 3. Cast-Iron: Cast or fabricated wall pipe equivalent to ductile-iron pressure pipe, having plain ends and integral water stop, except where other features are specified.
 4. Wall Penetration Systems: Wall sleeve assembly, consisting of housing, gaskets, and pipe sleeve, with 1 mechanical-joint end conforming to AWWA C110 and 1 plain pipe-sleeve end.
 - a. Penetrating Pipe Deflection: 5 percent without leakage.
 - b. Housing: Ductile-iron casting having waterstop and anchor ring, with ductile-iron gland, steel studs and nuts, and rubber gasket conforming to AWWA C111, of housing and gasket size as required to fit penetrating pipe.
 - c. Pipe Sleeve: AWWA C151, ductile-iron pipe.
 - d. Housing-to-Sleeve Gasket: Rubber or neoprene push-on type of manufacturer's design.
 5. Cast-Iron Sleeve Fittings: Commercially made sleeve having an integral clamping flange, with clamping ring, bolts, and nuts for membrane flashing.
 - a. Underdeck Clamp: Clamping ring with setscrews.

2.4 GROUT

- A. Nonshrink, Nonmetallic Grout: ASTM C1107, Grade B.
1. Characteristics: Post-hardening, volume-adjusting, dry, hydraulic-cement grout, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
 2. Design Mix: 5000-psi 28-day compressive strength.
 3. Packaging: Premixed and factory-packaged.

PART 3 - EXECUTION

3.1 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. General: Install piping as described below, except where system Sections specify otherwise. Individual piping system Specification Sections in Division 23 specify piping installation requirements unique to the piping system.
- B. General Locations and Arrangements: Drawings (Plans, schematics, and diagrams) indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated, except where deviations to layout are approved on coordination drawings.
- C. Install piping at indicated slope or as required by code and/or standard.
- D. Install components having pressure rating equal to or greater than system operating pressure.
- E. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.
- F. Install piping free of sags and bends.
- G. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.
- H. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.

- I. Install piping to allow application of insulation plus 1-inch clearance around insulation.
- J. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
- K. Install fittings for changes in direction and branch connections.
- L. Install couplings according to manufacturer's printed instructions.
- M. Install pipe escutcheons for pipe penetrations of concrete and masonry walls, wall board partitions, and suspended ceilings according to the following:
 - 1. Chrome-Plated Piping: Cast-brass, 1-piece, with setscrew, and polished chrome-plated finish. Use split-casting escutcheons, where required, for existing piping.
 - 2. Uninsulated Piping Wall Escutcheons: Cast-brass or stamped-steel, with setscrew.
 - 3. Uninsulated Piping Floor Plates in Utility Areas: Cast-iron floor plates.
 - 4. Insulated Piping: Cast-brass or stamped-steel, with concealed hinge, spring clips, and chrome-plated finish.
 - 5. Piping in Utility Areas: Cast-brass or stamped-steel, with setscrew or spring clips.
- N. Sleeves are required for core drilled holes.
- O. Install sleeves for pipes passing through concrete and masonry walls, concrete floor and roof slabs, and where indicated.
- P. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, concrete floor and roof slabs, and where indicated.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 4 inches above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring where specified.
 - 2. Build sleeves into new walls and slabs as work progresses.
 - 3. Install large enough sleeves to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
 - a. Steel Pipe Sleeves: For pipes smaller than 6 inches.
 - b. Steel Sheet-Metal Sleeves: For pipes 6 inches and larger that penetrate gypsum-board partitions.
 - c. Cast-Iron Sleeve Fittings: For floors having membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 4 inches above finished floor level. Flashing is specified in Division 07 Section "Sheet Metal."
 - 1) Seal space outside of sleeve fittings with nonshrink, nonmetallic grout.
 - 4. Except for below-grade wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using elastomeric joint sealants specified in Section 07 92 00 "Joint Sealers."
- Q. Above Grade, Exterior Wall, and Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.
 - 1. Install steel pipe for sleeves smaller than 6 inches.
 - 2. Install cast-iron wall pipes for sleeves 6 inches and larger.
 - 3. Assemble and install mechanical seals according to manufacturer's printed instructions.
- R. Below Grade, Exterior Wall, and Pipe Penetrations: Install cast-iron wall pipes for sleeves. Seal pipe penetrations using mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.
 - 1. Below Grade, Exterior Wall, and Pipe Penetrations: Install ductile-iron wall penetration system sleeves according to manufacturer's printed installation instructions.
- S. Fire Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestopping sealant material. Firestopping materials are specified in Division 07 Section "Firestopping."

- T. Verify final equipment locations for roughing in.
- U. Refer to equipment Specifications in other Sections for roughing-in requirements.
- V. Piping Joint Construction: Join pipe and fittings as follows and as specifically required in individual piping system Sections.
 - 1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
 - 2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
 - 3. Soldered Joints: Construct joints according to AWS "Soldering Manual," Chapter 22 "The Soldering of Pipe and Tube."
 - 4. Brazed Joints: Construct joints according to AWS "Brazing Manual" in the "Pipe and Tube" chapter.
 - 5. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full inside diameter. Join pipe fittings and valves as follows:
 - a. Note the internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
 - b. Apply appropriate tape or thread compound to external pipe threads (except where dry seal threading is specified).
 - c. Align threads at point of assembly.
 - d. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.
 - e. Damaged Threads: Do not use pipe or pipe fittings having threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
 - 6. Welded Joints: Construct joints according to AWS D10.12 "Recommended Practices and Procedures for Welding Low Carbon Steel Pipe" using qualified processes and welding operators according to the "Quality Assurance" Article.
 - 7. Flanged Joints: Align flange surfaces parallel. Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.
- W. Piping Connections: Except as otherwise indicated, make piping connections as specified below.
 - 1. Install unions in piping 2 inches and smaller adjacent to each valve and at final connection to each piece of equipment having a 2-inch or smaller threaded pipe connection.
 - 2. Install flanges in piping 2-1/2 inches and larger adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.
 - 3. Dry Piping Systems (Gas): Install dielectric unions and flanges to connect piping materials of dissimilar metals.
 - 4. Wet Piping Systems (Water): Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.2 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to provide the maximum possible headroom where mounting heights are not indicated.
- B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to the Architect. Contractor shall install equipment to maintain all manufacturers recommended clearances and clearances required by all local, state, and national codes.
- C. Install equipment level and plumb, parallel, and perpendicular to other building systems and components in exposed interior spaces, except where otherwise indicated.

- D. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.
- E. Install equipment giving right-of-way to piping systems installed at a required slope.

3.3 ACCESS DOORS

- A. Furnish an access door for each pipe chase for each floor. This includes both toilet plumbing chases and pipe riser chases. Access doors assembly to be size 16- x 16-inch.
- B. Also, furnish access doors in all non-removable ceiling and in partitions and walls where necessary access to plumbing cleanouts, shock absorbers, fire dampers, manual dampers, valves, and other mechanical devices requiring access. Size these as required for access with minimum size of 12- x 12-inch.
- C. Any access doors furnished for installation in fire rated surfaces or assembly shall carry an approved fire rating for that use.
- D. Any access doors furnished for installation in glued on acoustical surfaces or assembly shall have recessed door to allow installation of tiles.
- E. Provide all access doors to the General Contractor for them to construct into the building.

3.4 PAINTING AND FINISHING

- A. Refer to Division 09 Section "Interior Painting": for field painting requirements.
- B. Damage and Touch Up: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.5 ERECTION OF METAL SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
- B. Field Welding: Comply with AWS D1.1 "Structural Welding Code--Steel."

3.6 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage to support and anchor mechanical materials and equipment.
- B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

3.7 CUTTING AND PATCHING

- A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for mechanical installations. Perform cutting by skilled mechanics of the trades involved.
- B. Repair cut surfaces to match adjacent surfaces.

3.8 GROUTING

- A. Install nonmetallic nonshrink grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors. Mix grout according to manufacturer's printed instructions.
- B. Clean surfaces that will come into contact with grout.

- C. Provide forms for placement of grout, as required.
- D. Avoid air entrapment when placing grout.
- E. Place grout to completely fill equipment bases.
- F. Place grout on concrete bases to provide a smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout according to manufacturer's printed instructions.

END OF SECTION

SECTION 23 05 29 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Pipe and equipment hangers and supports.
 - 2. Sleeves and seals.
 - 3. Flashing and sealing equipment and pipe stacks.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. ASME B31.9 - Building Services Piping.
- B. ASTM F708 - Design and Installation of Rigid Pipe Hangers.
- C. MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
- D. MSS SP69 - Pipe Hangers and Supports - Selection and Application.
- E. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
- F. NFPA 13 - Installation of Sprinkler Systems.
- G. UL 203 - Pipe Hanger Equipment for Fire Protection Service

1.3 SUBMITTALS

- A. Submit under provisions of Section 23 05 00 “General Mechanical Requirements.
- B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.
- C. Product Data: Provide manufacturers catalog data including load capacity.
- D. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.
- E. Manufacturer's Installation Instructions: Indicate special procedures and assembly of components.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable code for support of plumbing, hydronic piping, and steam and steam condensate.
- B. Supports for Sprinkler Piping: In conformance with NFPA 13.

PART 2 - PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

- A. Manufacturers:
 - 1. Autogrip.
 - 2. Other acceptable manufacturers offering equivalent products.
 - a. Kin-Line.
 - b. Kindorff.
 - c. Michigan Hanger.
 - 3. Substitutions: Refer to Section 23 05 00 “General Mechanical Requirements.

- B. Fire Protection Piping:
 - 1. Conform to NFPA 13.
 - 2. Hangers for Pipe Sizes 1/2- to 1-1/2-Inch: Carbon steel, adjustable swivel, split ring.
 - 3. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 5. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
 - 6. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
 - 7. Vertical Support: Steel riser clamp.
 - 8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - 9. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.2 ACCESSORIES

- A. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.

2.3 INSERTS

- A. Manufacturers:
 - 1. Autogrip.
 - 2. Other acceptable manufacturers offering equivalent products.
 - a. Kin-Line.
 - b. Kindorff.
 - c. Michigan Hanger.
 - 3. Substitutions: Refer to Section 01 60 00 "Product Requirements" and Section 23 05 00 "General Mechanical Requirements."
- B. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.4 SLEEVES

- A. Manufacturers:
 - 1. Autogrip.
 - 2. Other acceptable manufacturers offering equivalent products.
 - a. Kin-Line.
 - b. Kindorff.
 - c. Michigan Hanger.
 - 3. Substitutions: Refer to Sections 01 60 00 "Product Requirements" and 23 05 00 "General Mechanical Requirements."
- B. Sleeves for Pipes Through Non-fire Rated Floors: 18-gauge-thick galvanized steel.
- C. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18-gauge-thick galvanized steel.
- D. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed.
- E. Sleeves for Round Ductwork: Galvanized steel.
- F. Sleeves for Rectangular Ductwork: Galvanized steel or wood.
- G. Firestopping Insulation: Glass fiber type, non-combustible.
- H. Sealant: Acrylic.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.2 INSERTS

- A. Provide inserts for placement in concrete formwork.
- B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- E. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut flush with top of slab.

3.3 PIPE HANGERS AND SUPPORTS

- A. Support horizontal piping as scheduled.
- B. Install hangers to provide minimum 1/2-inch space between finished covering and adjacent Work.
- C. Place hangers within 12 inches of each horizontal elbow.
- D. Use hangers with 1-1/2-inch minimum vertical adjustment.
- E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- H. Support riser piping independently of connected horizontal piping.
- I. Provide copper plated hangers and supports for copper piping.
- J. Design hangers for pipe movement without disengagement of supported pipe.
- K. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

3.4 SLEEVES

- A. Set sleeves in position in formwork. Provide reinforcing around sleeves.
- B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- C. Extend sleeves through floors one inch above finished floor level. Caulk sleeves.
- D. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with fire stopping insulation and caulk air tight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- E. Install chrome plated steel escutcheons at finished surfaces.

3.5 SCHEDULES

HANGER ROD		
PIPE SIZE (Inches)	MAX. HANGER SPACING (Feet)	DIAMETER (Inches)
1/2 to 1-1/4	6.5	3/8
1-1/2 to 2	10	3/8
2-1/2 to 3	10	1/2
4 and above	10	5/8
C.I. Bell and Spigot (or No-Hub) and at Joints	5	1/2
		1/2

END OF SECTION

SECTION 23 05 53 - MECHANICAL IDENTIFICATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Nameplates.
 - 2. Tags.
 - 3. Stencils.
 - 4. Pipe Markers.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 SCOPE

- A. Contractor shall coordinate all mechanical identification with UMC standards, verify at jobsite.

1.3 REFERENCES

- A. ASME A13.1 - Scheme for the Identification of Piping Systems.

1.4 SUBMITTALS FOR REVIEW

- A. Section 23 05 00 "General Mechanical Requirements" for submittals.
- B. Submit list of wording, symbols, letter size, and color coding for mechanical identification.
- C. **SUBMIT VALVE CHART AND SCHEDULE, INCLUDING VALVE TAG NUMBER, LOCATION, FUNCTION, AND VALVE MANUFACTURER'S NAME AND MODEL NUMBER.**
- D. Product Data: Provide manufacturers catalog literature for each product required.

1.5 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Instructions: Indicate installation instructions, special procedures, and installation.

1.6 SUBMITTALS AT PROJECT CLOSEOUT

- A. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.
- B. Valve Tag Chart.

1.7 REGULATORY REQUIREMENTS

- A. Conform to NFPA 99 requirements for labeling and identification of medical gas piping systems and accessories.

PART 2 - PRODUCTS

2.1 NAMEPLATES

- A. Manufacturer: Seaton.
- B. Other acceptable manufacturers offering equivalent products.
 - 1. Almatek.
 - 2. Brady, USA.
 - 3. Panduit.
 - 4. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
- C. Description: Laminated 3-layer plastic with engraved black letters on light contrasting background color.

2.2 TAGS

- A. Plastic Tags:
 - 1. Manufacturers:
 - a. Brady, USA.
 - b. Panduit.
 - c. Seaton.
 - d. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - 2. Laminated 3-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inches diameter.
- B. Metal Tags:
 - 1. Manufacturers:
 - a. Almetek.
 - b. Panduit.
 - c. Seaton.
 - d. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - 2. Brass with stamped letters; tag size minimum 1-1/2 inches diameter with smooth edges.
- C. Information Tags:
 - 1. Manufacturers:
 - a. Almetek.
 - b. Panduit.
 - c. Seaton.
 - d. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - 2. Clear plastic with printed "Danger," "Caution," or "Warning" and message; size 3-1/4 x 5-5/8 inches with grommet and self-locking nylon ties.
- D. Tag Chart: Typewritten letter size list plastic laminated.

2.3 STENCILS

- A. Manufacturer: Seaton.
- B. Other acceptable manufacturers offering equivalent products.
 - 1. Almetek.
 - 2. Brady, USA.
 - 3. Panduit.
 - 4. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."

- C. Stencils: With clean cut symbols and letters of following size:
 - 1. Up to 2-inch Outside Diameter of Insulation or Pipe: 1/2-inch-high letters.
 - 2. 2-1/2 to 6 inches Outside Diameter of Insulation or Pipe: 1-inch-high letters.
 - 3. Over 6 inches Outside Diameter of Insulation or Pipe: 1-3/4 inch-high letters.
 - 4. Ductwork and Equipment: 1-3/4-inch-high letters.
- D. Stencil Paint: As specified, semi-gloss enamel, colors and lettering size conforming to ASME A13.1.

2.4 PIPE MARKERS

- A. Color and Lettering: Conform to ASME A13.1.
- B. Plastic Pipe Markers:
 - 1. Manufacturers:
 - a. Almetek.
 - b. Panduit.
 - c. Seaton.
 - d. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - 2. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.
- C. Plastic Tape Pipe Markers:
 - 1. Manufacturers:
 - a. Almetek.
 - b. Brady, USA.
 - c. Seaton.
 - d. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - 2. Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
- D. Plastic Underground Pipe Markers:
 - 1. Manufacturers:
 - a. Almetek.
 - b. Brady USA.
 - c. Seaton.
 - d. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - 2. Bright-colored continuously-printed plastic ribbon tape, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service.

2.5 CEILING TACKS

- A. Manufacturer: Seaton.
- B. Other acceptable manufacturers offering equivalent products.
 - 1. Almetek.
 - 2. Brady, USA.
 - 3. Panduit.
 - 4. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
- C. Description: Steel with 3/4-inch-diameter color-coded head.
- D. Color code as follows:
 - 1. HVAC equipment: Yellow.
 - 2. Fire dampers/smoke dampers: Red.
 - 3. Plumbing valves: Green.
 - 4. Heating/cooling valves: Blue.

2.6 LABELS

- A. Manufacturer: Seaton.
- B. Other acceptable manufacturers offering equivalent products.
 - 1. Almetek.
 - 2. Brady, USA.
 - 3. Panduit.
 - 4. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
- C. Description: Aluminum, size 1.9 x 0.75 inches, adhesive backed with printed identification.

2.7 LOCKOUT DEVICES

- A. Lockout Hasps:
 - 1. Manufacturers:
 - a. Brady, USA.
 - b. Panduit.
 - c. Seaton.
 - d. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - 2. Anodized aluminum hasp with erasable label surface; size minimum 7-1/4 x 3 inches.
- B. Valve Lockout Devices:
 - 1. Manufacturers:
 - a. Brady, USA.
 - b. Panduit.
 - c. Seaton.
 - d. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - 2. Steel device preventing access to valve operator, accepting lock shackle.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.
- B. Prepare surfaces in accordance with Manufacturer instructions for stencil painting.

3.2 INSTALLATION

- A. Install identifying devices after completion of coverings and painting.
- B. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- C. Install labels with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.
- D. Install tags using corrosion resistant chain. Number tags consecutively by location.
- E. Apply stencil painting in accordance with manufacturer's requirements.
- F. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
- G. Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with stencil painting. Small devices, such as in-line pumps, may be identified with tags.
- H. Identify control panels and major control components outside panels with plastic nameplates.
- I. Identify valves in main and branch piping with tags.
- J. Identify air terminal units and radiator valves with numbered tags.
- K. Tag automatic controls, instruments, and relays. Key to control schematic.

- L. Identify piping, concealed or exposed, with plastic tape pipe markers. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
- M. Identify ductwork with stenciled painting. Identify with air handling unit identification number and area served. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction.
- N. Provide ceiling tacks to locate valves or dampers above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

3.3 SCHEDULES

- A. Identification – per ASME A13.1 “Scheme for the Identification of Piping Systems.” Owner standards supersedes standard ASME standards.

END OF SECTION

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Testing, adjustment, and balancing of air systems.
 - 2. Testing, adjustment, and balancing of hydronic heating and chilled water systems.
 - 3. Measurement of final operating condition of HVAC systems.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 SCOPE OF WORK

- A. TAB Contractor shall provide all intermediate balancing of the HVAC systems and shall provide final balance of each system installed and/or modified under this Project. TAB Contractor shall coordinate with DDC Contractor and Mechanical Contractor to achieve a fully-operational system. Owner-preferred TAB Contractor is N.D. White.

1.3 REFERENCES

- A. AABC - National Standards for Total System Balance.
- B. ADC - Test Code for Grilles, Registers, and Diffusers.
- C. ASHRAE 111 - Practices for Measurement, Testing, Adjusting, and Balancing of Building Heating, Ventilation, Air-conditioning, and Refrigeration Systems.
- D. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.
- E. SMACNA - HVAC Systems Testing, Adjusting, and Balancing.

1.4 SUBMITTALS

- A. Submit under provisions of Section 23 05 00 "General Mechanical Requirements."
- B. Submit name of adjusting and balancing agency for approval within 30 days after award of Contract.
- C. Field Reports: Submit under provisions of Section 23 05 00 "General Mechanical Requirements."
- D. Field Reports: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
- E. Prior to commencing Work, submit report forms or outlines indicating adjusting, balancing, and equipment data required.
- F. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect and for inclusion in operating and maintenance manuals.
- G. Provide reports in hard cover, letter size, 3-ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets and indicating thermostat locations.
- H. Include detailed procedures, agenda, sample report forms and copy of AABC National Project Performance Guaranty prior to commencing system balance.

- I. Test Reports: Indicate data on AABC National Standards for Total System Balance forms, forms prepared following ASHRAE 111 or NEBB forms.
- J. Provide copy of the respective balancing document being used for this Project. AABC National Standards for Field Measurement and Instrumentation, Total System Balance, ASHRAE 111, or NEBB Procedural Standards for Testing, Balancing, and Adjusting of Environmental Systems being used for Project.

1.5 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 23 05 00 “General Mechanical Requirements.”
- B. Record actual locations of flow measuring stations, balancing valves, and rough setting.

1.6 QUALITY ASSURANCE

- A. Perform total system balance in accordance with AABC National Standards for Field Measurement and Instrumentation, Total System Balance, ASHRAE 111, or NEBB Procedural Standards for Testing, Balancing, and Adjusting of Environmental Systems.
- B. Maintain 1 copy of respective document onsite.

1.7 QUALIFICATIONS

- A. Agency: Company specializing in the testing, adjusting, and balancing of systems specified in this Section with minimum 3 years documented experience certified by AABC or NEBB.
- B. Perform Work under supervision of AABC Certified Test and Balance Engineer, NEBB Certified Testing, Balancing, and Adjusting Supervisor or Registered Professional Engineer experienced in performance of this Work and licensed in the State of Texas.

1.8 SEQUENCING

- A. Sequence Work under the provisions of Section 23 05 00 “General Mechanical Requirements.”
- B. Sequence Work to commence after completion of systems and schedule completion of Work before Substantial Completion of Project.

1.9 SCHEDULING

- A. Schedule Work under the provisions of Section 23 05 00 “General Mechanical Requirements.”

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify systems are complete and operable before commencing Work. Ensure these conditions:
 - 1. Systems are started and operating in a safe and normal condition.
 - 2. Temperature control systems are installed complete and operable.
 - 3. Proper thermal overload protection is in place for electrical equipment.
 - 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
 - 5. Duct systems are clean of debris.

6. Fans are rotating correctly.
 7. Volume dampers are in place and open.
 8. Air coil fins are cleaned and combed.
 9. Access doors are closed and duct end caps are in place.
 10. Air outlets are installed and connected.
 11. Duct system leakage is minimized.
 12. Proper strainer baskets are clean and in place.
 13. Service and balance valves are open.
- B. Submit field reports. Report defects and deficiencies noted during performance of services, which prevent system balance.
- C. Beginning of Work means acceptance of existing conditions.

3.2 PREPARATION

- A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Architect to facilitate spot checks during testing.
- B. Provide additional balancing devices as required.

3.3 INSTALLATION TOLERANCES

- A. Air Handling Systems: Adjust to within ± 5 percent of design for supply systems and ± 5 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within +5 percent and -5 percent of design to space. Adjust outlets and inlets in space to within ± 5 percent of design.
- C. Hydronic Systems: Adjust to within ± 10 percent of design.

3.4 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. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- D. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- E. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner and Architect.
- F. Check and adjust systems approximately 6 months after final acceptance and submit report to Owner and Architect.

3.5 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.

- E. Use volume control devices to regulate air quantities only to extent that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- K. 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.
- L. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches positive static pressure near the building entries.

3.6 WATER SYSTEM PROCEDURE

- A. Adjust water systems to provide required or design quantities.
- B. Use calibrated pressure gauges to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in the system.
- C. Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.
- D. Effect system balance with automatic control valves fully open to heat transfer elements.
- E. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.
- F. Where available pump capacity is less than total flow requirements or individual system parts, full flow in one part may be simulated by temporary restriction of flow to other parts.

3.7 SCHEDULES

- A. Equipment Requiring Testing, Adjusting, and Balancing:
 - 1. Chilled water (AHU-2, to be re-commissioned).
 - 2. Heating Water (AHU-2, to be re-commissioned).
 - 3. Air Handling Unit (AHU-2, to be re-commissioned).
 - 4. Existing Exhaust Fan, EF-1, to be re-commissioned.
 - 5. Existing Fan Coil Unit, FCU-1, to be re-commissioned.
 - 6. Operating Room Supply Air Distribution System.
 - 7. Air Inlets and Outlets.
- B. Report Forms:
 - 1. Title Page:
 - a. Name of Testing, Adjusting, and Balancing Agency.
 - b. Address of Testing, Adjusting, and Balancing Agency.
 - c. Telephone and fax numbers of Testing, Adjusting, and Balancing Agency.
 - d. Project name.
 - e. Project location.

- f. Project Architect.
- g. Project Engineer.
- h. Project Contractor.
- i. Project altitude.
- j. Report date.
2. Summary Comments:
 - a. Design versus final performance.
 - b. Notable characteristics of system.
 - c. Description of systems operation sequence.
 - d. Summary of outdoor and exhaust flows to indicate amount of building pressurization.
 - e. Nomenclature used throughout report.
 - f. Test conditions.
3. Instrument List:
 - a. Instrument.
 - b. Manufacturer.
 - c. Model number.
 - d. Serial number.
 - e. Range.
 - f. Calibration date.
4. Electric Motors:
 - a. Manufacturer.
 - b. Nameplate Data.
 - c. Model/Frame.
 - d. HP/BHP.
 - e. Phase, voltage, amperage; nameplate, actual, no load.
 - f. RPM.
 - g. Service factor.
 - h. Starter size, rating, heater elements.
 - i. Sheave Make/Size/Bore.
5. V-Belt Drive:
 - a. Identification/location.
 - b. Required driven RPM.
 - c. Driven sheave, diameter and RPM.
 - d. Belt, size and quantity.
 - e. Motor sheave diameter and RPM.
 - f. Center to center distance, maximum, minimum, and actual.
6. AHU Cooling Coil Data:
 - a. Identification/number.
 - b. Location.
 - c. Service.
 - d. Manufacturer.
 - e. Nameplate Data.
 - f. Air flow, design and actual.
 - g. Entering air DB temperature, design and actual.
 - h. Entering air WB temperature, design and actual.
 - i. Leaving air DB temperature, design and actual.
 - j. Leaving air WB temperature, design and actual.
 - k. Water flow, design and actual.
 - l. Water pressure drop, design and actual.

- m. Entering water temperature, design and actual.
 - n. Leaving water temperature, design and actual.
 - o. Saturated suction temperature, design and actual.
 - p. Air pressure drop, design and actual.
7. AHU Heating and Pre-Heat Coil Data:
- a. Identification/number.
 - b. Location.
 - c. Service.
 - d. Manufacturer.
 - e. Nameplate Data.
 - f. Air flow, design and actual.
 - g. Water flow, design and actual.
 - h. Water pressure drop, design and actual.
 - i. Entering water temperature, design and actual.
 - j. Leaving water temperature, design and actual.
 - k. Entering air temperature, design and actual.
 - l. Leaving air temperature, design and actual.
 - m. Air pressure drop, design and actual.
8. AHU Return Air/Outside Air/Supply Air Data:
- a. Identification/location.
 - b. Design supply air flow.
 - c. Actual supply air flow.
 - d. Design return air flow.
 - e. Actual return air flow.
 - f. Design outside air flow.
 - g. Actual outside air flow.
 - h. Return air temperature.
 - i. Outside air temperature.
 - j. Required mixed air temperature.
 - k. Actual mixed air temperature.
 - l. Design outside/return air ratio.
 - m. Actual outside/return air ratio.
9. Fan Coil Unit Data:
- a. Manufacturer.
 - b. Identification/number.
 - c. Location.
 - d. Nameplate Data.
 - e. Model number.
 - f. Size.
 - g. Air flow, design and actual.
 - h. Entering air DB temperature, design and actual.
 - i. Entering air WB temperature, design and actual.
 - j. Leaving air DB temperature, design and actual.
 - k. Leaving air WB temperature, design and actual.
 - l. Water flow, design and actual.
 - m. Water pressure drop, design and actual.
 - n. Entering water temperature, design and actual.
 - o. Leaving water temperature, design and actual.

10. Exhaust Fan Data:
 - a. Location.
 - b. Manufacturer.
 - c. Nameplate data.
 - d. Model number.
 - e. Serial number.
 - f. Air flow, specified and actual.
 - g. Total static pressure (total external), specified and actual.
 - h. Inlet pressure.
 - i. Discharge pressure.
 - j. Sheave Make/Size/Bore.
 - k. Number of Belts/Make/Size.
 - l. Fan RPM.
11. Duct Traverse:
 - a. System zone/branch.
 - b. Duct size.
 - c. Area.
 - d. Design velocity.
 - e. Design air flow.
 - f. Test velocity.
 - g. Test air flow.
 - h. Duct static pressure.
 - i. Air temperature.
 - j. Air correction factor.
12. Air Distribution Test Sheet:
 - a. Air terminal number.
 - b. Room number/location.
 - c. Terminal type.
 - d. Terminal size.
 - e. Area factor.
 - f. Design velocity.
 - g. Design air flow.
 - h. Test (final) velocity.
 - i. Test (final) air flow.
 - j. Percent of design air flow.

END OF SECTION

SECTION 23 07 13 – DUCTWORK INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ductwork insulation.
 - 2. Insulation jackets.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 40 00 “References.”

1.2 REFERENCES:

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate Metric).
- B. ASTM C518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- C. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
- D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
- E. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
- F. ASTM C1071 - Standard Specification for Thermal and Acoustical Insulation (Glass Fiber, Duct Lining Material).
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- H. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
- I. ASTM E162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.
- J. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- K. NAIMA National Insulation Standards.
- L. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- M. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- N. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS FOR REVIEW

- A. Section 23 05 00 “General Mechanical Requirements” for submittals.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.4 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Instructions: Indicate installation procedures which ensure acceptable workmanship and installation standards will be achieved.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum 3 years documented experience.
- B. Applicator Qualifications: Company specializing in performing the Work of this Section with minimum 3 years documented experience and approved by manufacturer.

1.6 REGULATORY REQUIREMENTS

- A. Materials: Flame spread/smoke developed rating of 25/50 in accordance with ASTM E84, NFPA 255 and UL 723.

1.7 DELIVERY, STORAGE, AND PROTECTION

- 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.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
- B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 - PRODUCTS

2.1 GLASS FIBER, FLEXIBLE

- A. Manufacturer:
 - 1. Certainteed.
 - 2. Knauf.
 - 3. Owen Corning.
 - 4. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
- B. Insulation: ASTM C553; flexible, noncombustible blanket.
 - 1. 'K' ('Ksi') value: ASTM C518, 0.31 at 75 degrees F.
 - 2. Maximum service temperature: 250 degrees F.
 - 3. Maximum moisture absorption: 0.20 percent by volume.
 - 4. Minimum "R" value: 6.0 (h • ft²)/Btu.
- C. Vapor Barrier Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film 0.0032-inch vinyl.
 - 2. Moisture vapor transmission: ASTM E96; 0.02 perm.
 - 3. Secure with pressure sensitive tape.

- D. Vapor Barrier Tape:
 - 1. Manufacturer:
 - a. Certaineed.
 - b. Knauf.
 - c. Owen Corning.
 - d. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - 2. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
- E. Tie Wire: Annealed steel, 16 gauge.

2.2 GLASS FIBER, RIGID

- A. Manufacturer:
 - 1. Certaineed.
 - 2. Knauf.
 - 3. Owen Corning.
 - 4. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
- B. Insulation: ASTM C612; rigid, noncombustible blanket.
 - 1. 'K' ('Ksi') value: ASTM C518, 0.24 at 75 degrees F.
 - 2. Maximum service temperature: 250 degrees F.
 - 3. Maximum moisture absorption: 0.20 percent by volume.
 - 4. Density: 3.0 lb/cu ft.
 - 5. Minimum "R" value: 6.0 (h • ft²)/Btu.
- C. Vapor Barrier Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film 0.0032-inch vinyl.
 - 2. Moisture vapor transmission: ASTM E96; 0.04 perm.
 - 3. Secure with 2 coats of vapor barrier mastic and glass tape.
- D. Vapor Barrier Tape:
 - 1. Manufacturer:
 - a. Certaineed.
 - b. Knauf.
 - c. Owen Corning.
 - d. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - 2. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
- E. Indoor Vapor Barrier Finish:
 - 1. Manufacturers:
 - a. Certaineed.
 - b. Knauf.
 - c. Owen Corning.
 - d. Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - 2. Cloth: Untreated; 9 oz/sq yd weight, glass fabric.
 - 3. Vinyl emulsion type acrylic, compatible with insulation, white color.

2.3 JACKETS

- A. Canvas Jacket: UL listed.
 - 1. Fabric: ASTM C921, 6 oz/sq yd, plain weave cotton treated with dilute fire retardant lagging adhesive.
 - 2. Lagging Adhesive:
 - a. Manufacturers:
 - 1) Certainteed.
 - 2) Knauf.
 - 3) Owen Corning.
 - 4) Substitutions: Refer to Section 23 05 00 "General Mechanical Requirements."
 - b. Compatible with insulation.
- B. Aluminum Jacket: ASTM B209.
 - 1. Thickness: 0.016-inch sheet.
 - 2. Finish: Embossed.
 - 3. Joining: Longitudinal slip joints and 2-inch laps.
 - 4. Fittings: 0.016-inch-thick die shaped fitting covers with factory attached protective liner.
 - 5. Metal Jacket Bands: 3/8-inch-wide; 0.010-inch-thick stainless steel.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that ductwork has been tested before applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

3.2 INSTALLATION

- A. Install in accordance with NAIMA National Insulation Standards.
- B. Insulated ductwork conveying air below ambient temperature:
 - 1. Provide insulation with vapor barrier jackets.
 - 2. Finish with tape and vapor barrier jacket.
 - 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
 - 4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- C. Insulated ductwork conveying air above ambient temperature:
 - 1. Provide with or without standard vapor barrier jacket.
 - 2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.
- D. Ductwork Exposed in Mechanical Equipment Rooms or Finished Spaces (below 10 feet above finished floor): Finish with canvas jacket sized for finish painting.
- E. Exterior Applications: Provide insulation with vapor barrier jacket. Cover with caulked aluminum jacket with seams located on bottom side of horizontal duct section.

3.3 SCHEDULES

- A. All supply, O.A. Ducts, exhaust, and Return Ducts: Must provide insulation thickness to meet minimum "R" value requirement of 6.0.

END OF SECTION

SECTIONS 23 09 23 – DIRECT DIGITAL CONTROL SYSTEM FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 ACCEPTABLE MANUFACTURERS

- A. Johnson Controls, Inc., will be sub-contracted directly through UMC for this Project. Information contained within is for guidance purposes only, based on previous projects in this area. Any information herein that contradicts current conditions or new UMC standards is to be ignored. Not all information provided in this Specification Section may be applicable or required for this Project.

1.3 SCOPE

- A. Summary: This Project is to modify the existing AHU-2, serving Hybrid OR #8, to provide and serve the occupant requirements of 60 degrees F when needed and 80 degrees F when needed. Staff understands this will not be a "quick" change, so Contractor must provide test results going from 60 degrees F to 80 degrees F enough times to yield an "average" time of system change going in both directions. Based on the existing AHU-2 submittal information and chilled water data from TTUHSC, the unit is capable of providing 60 degrees F to 80 degrees F and maintain a humidification range of 30 percent to 60 percent. There must be a new temperature controller placed in the OR for staff to control the temperature of the OR based on the type of procedure being performed. Should new control valves be required, due to age or condition of the valves, Contractor should provide a "time & material" price for the replacement of the known controls at the site. Contractor to perform a minimum of 10 timed cycles going from 60 degrees F to 80 degrees F, reach a steady state room design temperature/humidity and then 10 timed cycles going from 80 degrees F to 60 degrees F, reach a steady state room design temperature/humidity. Contractor shall provide Owner with timed results and average times to achieve each steady state condition. Contractor to document hybrid OR #8 temperature/humidity, adjacent equipment room temperature/humidity, and ambient temperature/humidity levels during all tests. The fan coil unit (FCU-1) is to remain, a new exhaust air grille will be installed in the equipment room to provide the room with a negative pressure with respect to the adjacent hybrid operating room, refer to Drawings for CFM's.
- B. All Work associated with this Scope of Work shall be Metasys Extended Architecture product as manufactured by Johnson Controls and shall report to the existing ADX server without the use of any gateways.
- C. Furnish all labor, materials, equipment, and service necessary for a complete and operating temperature control system, utilizing a high speed peer-to-peer network of Direct Digital Controls (DDC) as shown on the Drawings and as described herein.
- D. Drawings are diagrammatic only. Equipment and labor not specifically referred to herein or on the Plans, that are required to meet the functional intent, shall be provided without additional cost to the Owner.

- E. Complete temperature control system to be DDC with electronic sensors and electric actuation of valves and dampers and electronic actuation of terminal equipment valves and actuators as specified herein.
- F. All Work described in this Section shall be installed, wired, circuit tested, and calibrated by factory certified technicians qualified for this work and in the regular employment of the temperature control system manufacturer. The local installing office shall be a manufacturer-owned branch and shall have a minimum of 20 years of installation experience. Supervision, calibration, and checkout of the system shall be by the employees of the local temperature control contracting office. Supplier shall have an in-place support facility within 150 miles of the site with technical staff, spare parts inventory, and all necessary test and diagnostic equipment.
- G. All installation labor (i.e., wiring, conduit, tubing, etc.) and installation material for the installation of the control system, including all power requirements, shall be provided by the temperature control subcontractor.

1.4 DEFINITIONS

- A. ASC: Application Specific Controller.
- B. AHU: Air Handling Unit.
- C. BMS: Building Management System.
- D. DDC: Direct Digital Control.
- E. FMS: Facility Management System.
- F. GUI: Graphical User Interface.
- G. HVAC: Heating, Ventilation, and Air Conditioning.
- H. LAN: Local Area Network.
- I. NAE: Network Automation Engineer.
- J. UNT: Unitary Controller.
- K. PID: Proportional, Integral, Derivative.
- L. UDP: User Datagram Protocol.

1.5 FMS DESCRIPTION

- A. The FMS shall be a complete system designed for use on Intranets and the Internet. This functionality shall extend into the equipment rooms. Primary nodes located in equipment rooms and similar shall be fully IT-compatible devices that mount and communicate directly on the IT infrastructure existing in the facility. Contractor shall be responsible for coordination with the Owner's IT staff to ensure that the FMS will perform in the Owner's environment without disruption to any of the other activities taking place on that LAN.
- B. All points of user interface shall be on standard PCs that do not require the purchase of any special software from the FMS manufacturer for use as a building operations terminal. The primary point of interface on these PCs will be a standard web browser such as Internet Explorer or Netscape.
- C. The FMS Work shall consist of all labor, materials, tools, equipment, software, software licenses, wiring, tubing, installation, engineering, calibration, documentation, submittals, testing, verification, training services, permits and licenses, management, warranties, services and items as Specified in these Division documents which are required for the complete, fully functional, and commissioned FMS.

1.6 QUALITY ASSURANCE:

- A. Bids by wholesalers, franchised, and non-franchised contractors shall not be acceptable.
- B. The system manufacturer shall, as a minimum, manufacture and supply the Application Specific Controllers, Supervisory Controllers, Graphical User Interface, damper actuators, and valve actuator assemblies.
- C. All Work described in this Section shall be installed, wired, circuit tested, and calibrated by factory certified technicians qualified for this Work and in the direct employment of the temperature control system manufacturer.
- D. The Building Management System Contractor shall have a full service facility within 20 miles of the Project that is staffed with Engineers in Johnson Controls systems and technicians fully capable of providing instructions and routine emergency maintenance service on all Johnson Controls system components.
- E. Mechanical equipment manufacturers desiring to provide DDC type controls as factory mounted equipment shall not be acceptable.
- F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- G. Comply with NFPA 90A - Installation of Air Conditioning and Ventilation Systems.
- H. Comply with National Electric Code.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory-mounted on equipment, arrange for shipping of control devices to unit manufacturer.

1.8 COORDINATION

- A. Coordinate location of thermostats and other exposed control sensors with plans and room details before installation.
- B. Coordinate supply of conditioned electrical circuits for control units and panels.

1.9 SYSTEM INSTALLATION GUIDELINES

- A. All exposed temperature control and interlock wiring shall be installed in conduit, unless otherwise noted on the plans. Power or interlock wiring shall be run in separate conduit from sensor and communications wiring.
- B. All non-plenum rated cable will be run in conduit from termination to termination points.
- C. Plenum rated cabling run in the return plenum above dropped ceilings does not need to be run in conduit, but shall be installed and supported as close as possible to the structural members. Main cable bundles shall, in general, run above Corridor ceilings, with individual cables extending above ceiling to the terminal units. Cable shall not lay on the ceiling grid, lights, ductwork etc. It will be run at right angles, parallel and perpendicular to the building lines with runouts into rooms being perpendicular to the main cable bundles.

- D. All wiring within Mechanical Rooms or Air Handling Rooms shall be run in conduit. Wiring extending from these rooms shall be installed in conduit that extends a minimum of 12 inches beyond the mechanical room wall. Remote satellite boxes used for housing control transformers shall be located above accessible ceilings of Corridors within 10 feet of mechanical rooms. Control transformers shall not be installed above ceilings of limited access areas such as offices, conference rooms, office suites, etc., or above non-accessible ceilings.
- E. All plenum rated cabling run in standard drywall construction will be run inside the wall in new or existing conduit which extends 6 inches above the top plate of the wall and exiting the wall through standard wall boxes.
- F. On wall constructed of solid concrete, cinder block or plaster, cables will be run in concealed conduit, surface wire mold or other approved raceway.
- G. No ceiling tiles will be removed or holes punched out to accommodate cable penetration into a room.
- H. All cabling will be labeled or tagged to indicate system served and termination number. Matching labels are required on both ends of the cable. Bundle labels shall be provided at every 50 feet on exposed runs or 25 feet on concealed runs, and at every entry/exit point throughout the run.
- I. Cabling shall be bundled neatly and well secured using nylon zip straps. It shall not be wrapped around piping or conduit. Support cabling at walls, to sub-ceiling or structural steel with wall locks or clamps. Cabling shall not be installed with excessive slack.
- J. Cables requiring crimp-on connectors must have those connectors attached with an appropriate and recommended specialized crimping tool.
- K. Identify each item, mounted on the face of a control panel, with an engraved nameplate (1/4-inch-high engraved letters minimum).
- L. Thermostats or sensors mounted on outside walls shall be mounted on an insulated mounting base (or equal).
- M. All sensor elements in water lines shall be installed in separable wells, packed with heat conductive compound.

1.10 SYSTEM PERFORMANCE

- A. Graphic Display: The system shall display a graphic with 20 dynamic points with all current data within 20 seconds.
- B. Graphic Refresh: The system shall update a graphic with 20 dynamic points with all current data within 20 seconds.
- C. Object Command: The maximum time between the command of a binary object by the operator and the reaction by the device shall be less than 5 seconds. Analog objects should start to adjust within 5 seconds.
- D. Object Scan: All changes of state and change of analog values will be transmitted over the high-speed network such that any data used or displayed at a controller or workstation will be updated within 60 seconds.
- E. Alarm Response Time: The maximum time from when an object goes into alarm to when it is annunciated at the workstation shall be 20 seconds.
- F. Program Execution Frequency: Custom and standard applications shall be capable of running as often as once every 5 seconds. The Contractor shall be responsible for selecting execution times consistent with the mechanical process under control.
- G. Performance: Digital controllers shall be able to execute DDC PID control loops at a selectable frequency of at least once per second. The controller shall scan and update the process value and output generated by this calculation at this same frequency.

- H. Multiple Alarm Annunciation: All workstations on the network must receive alarms within 5 seconds of each other.
- I. Reporting Accuracy: The system shall report all values with an end-to-end accuracy as listed or better than those listed below.

Measure Variable	Reported Accuracy
Space Temperature	±1°F
Ducted Air	±1°F
Outside Air	±2°F
Dew point	±3°F
Water Temperature	±1°F
Relative Humidity	±5% RH
Water Flow	±5% of full scale
Airflow (terminal)	±10% of reading
Airflow (measuring stations)	±5% of full scale
Air Pressure (ducts)	±0.1 "W.G.
Air Pressure (space)	±0.01 "W.G.
Water Pressure	±2% of full scale (absolute or differential)
Electrical	5% of reading (A, V, W, Power factor)
Carbon Dioxide (CO ₂)	±5% of reading

- J. Stability of Control: Control loops shall maintain measured variable at set point within the tolerances listed below:

Controlled Variable	Control Accuracy	Range of Medium
Air Pressure	±0.2" w.g.	0-6" w.g.
	±0.01" w.g.	-0.1 to 0.1" w.g.
Airflow	± 5% of full scale	
Temperature	±1.0°F	
Humidity	±5% RH	
Fluid Pressure	±1.5 psi	1-150 psi
	±1.0" w.g.	0-50"w.g. differential

1.11 WORK BY OTHERS

- A. Automatic Valves: Installed under applicable piping Section under supervision of the temperature control subcontractor. All reducers and fittings necessary to install smaller than pipe size valves shall be furnished and installed under applicable piping Sections.
- B. Automatic Dampers: Installed under Division 23, Air Distribution System, under supervision of the temperature control subcontractor.
- C. Smoke detectors shall be furnished and installed by the Division 26 contractor. The temperature controls subcontractor shall be responsible for interlock wiring between the smoke detectors and the air handling unit safety circuits.
- D. A dedicated 120v controls circuit will be provided by Division 26 for all VAV box controllers and DDC control panels.
- E. The kill switches for the air handling units will be provided and wired by Division 26 as seen on the Electrical Drawings (communication plans). "Kill Switch" for AHU-2 and FCU-1 are existing to remain.

1.12 SHOP DRAWINGS/SUBMITTALS

- A. Ten copies of Shop Drawings of the entire control system shall be submitted and shall consist of a complete list of equipment and materials, including manufacturer's catalog data sheets and installation instructions. Shop Drawings shall also contain complete wiring and schematic diagrams, software descriptions, calculations, and any other details required to demonstrate that the system has been coordinated and will properly function as a system. Terminal identification for all control wiring shall be shown on the Shop Drawings.
- B. A complete written Sequence of Operation as well as a hard copy graphical depiction of the application control programs shall also be included with the submittal package. Device identification as shown on the control schematics and wiring diagrams shall be referenced in the written Sequence of Operation.
- C. Listing and explanation of both standard and user defined configuration parameters for the device.
- D. System Architecture: Provide a schematic diagram of the Local Area Network and Johnson Controls architecture diagram indicating supervisory controllers, Graphical User Interface(s) and database server(s) including all devices and controllers installed by other trade contractors. This should be accompanied by explicit information regarding configuration of Routers, Bridges, and Repeaters. Schematic shall also include interface requirements with other systems including but not limited to: security systems, lighting controls, fire alarm, elevator status, and power monitoring system. Diagrams detailing the variables mapped between protocols shall be submitted for all gateways. Each schematic shall have all control points labeled. The schematic shall graphically show all control elements. The point name format shall be approved by the Engineer before any Drawing or programming proceeds.

1.13 WARRANTY

- A. The temperature control system contractor shall provide a 1-year warranty that will commence from the Date of Substantial Completion as determined by the Architect.
- B. The controls contractor shall respond to the job site within a 4-hour period for any emergency relating to the control system during the warranty period.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials and equipment used shall be standard components, of regular manufacture for this application. All systems and components shall have been thoroughly tested and proven in actual use.
- B. All products used in this Project shall be new, currently under manufacture, and shall be applied in similar installations for a minimum of 2 years. This installation shall not be used as a test site for any new products unless explicitly approved by Owner Representative in writing. Spare parts shall be available for at least 5 years after completion of this Contract.

2.2 MATERIALS

- A. Wiring and Conduit: All wire shall be copper and meet the minimum wire size and insulation class listed below:

Wire Class	Wire Size	Isolation Class
Power	12 gauge	600 volt
Class One	14 gauge std.	600 volt
Class Two	18 gauge std.	300 volt
Class Three	18 gauge std.	300 volt
Communications	Per mfr. recommendations	

- B. Power and Class One wiring may be run in the same conduit. Class Two and Three wiring and communications wiring may be run in the same conduit.
- C. Where different wiring classes terminate within the same enclosure, maintain clearances and install barriers per the National Electric Code.
- D. Where wiring is required to be installed in conduit, EMT shall be used. Conduit shall be minimum 1/2-inch galvanized EMT. Watertight compression fittings shall be used. Provide conduit seal-off fitting where exterior conduits enter the building or between areas of high temperature/moisture differential.
- E. Flexible metallic conduit (max. 3 feet) shall be used for connections to controllers, and sensors mounted on vibration producing equipment. Liquid-tight flexible conduit shall be use in exterior locations and interior locations subject to moisture.
- F. Junction boxes shall be provided at all cable splices, equipment terminations, and transitions from EMT to flexible conduit. Interior dry location J-boxes shall be galvanized pressed steel, nominal 4-inch square with blank cover. Exterior and damp location JH-boxes shall be cast alloy FS boxes with threaded hubs and gasketed covers.

2.3 CONTROL VALVES

- A. Control valves shall be two-way, constructed for tight shutoff and shall operate satisfactorily against system pressures and differentials. Valves with size up to and including 2-1/2 inches shall be "screwed" with 250 psi ANSI pressure body rating; 3 inches and larger valves shall be 'flanged' configuration. Proportional control valves shall be sized for a maximum pressure drop of 5.0 psig at rated flow (except as noted). The air handling unit control valves shall be the Johnson Controls VG2231 series. The terminal unit control valves shall be the Johnson Controls VG1000 series.

2.4 CONTROL AIR DAMPERS

- A. Control air dampers shall be parallel blade for two-position control and opposed blade for modulating control applications. Dampers shall be black enamel finish or galvanized, with nylon bearings. Blade edge and tip seals shall be included for all dampers. Leakage through the damper shall not exceed 6 CFM/square foot at 4 inches wg (based on a 48- x 48-inch test sample). Blades shall be 16 gauge minimum and 10 inches wide maximum and frame shall be of welded channel iron. Dampers with both dimensions under 18 inches may have strap iron frames. Dampers over 48 inches wide shall be equipped with a jack shaft to provide sufficient force throughout the intended operating range.

2.5 DAMPER AND VALVE ACTUATORS

- A. Control air damper actuators shall be electric, low voltage (24 VAC) utilizing a 4-20 mA modulating control signal as required by the sequence of operation. Each actuator shall incorporate a spring return to position the dampers to their normal positions upon a loss of the 24 VAC control power. Control air damper actuators shall be properly sized to provide sufficient torque to their respective dampers throughout the actuator's operating range. All control air damper actuators shall be mounted outside of the air stream.
- B. Valve actuators for heating water and chilled water systems shall be electric. Operators shall be sized to operate their appropriate valves with sufficient reserve power to provide smooth modulating action or two-position action as specified. The air handling unit heating coil control valve actuators shall be spring return normally open. The air handling unit cooling coil control valve actuators and the terminal box control valve actuators shall be last position.

2.6 CONTROL PANELS

- A. All application specific direct digital controllers, not specifically designed for direct mounting on the equipment served, shall be installed in NEMA 1 enclosures. Enclosures shall be of suitable size to accommodate all power supplies, relays and accessories required for the application. Each enclosure shall include a perforated subpanel for direct mounting of the enclosed devices. Include matched key locks for all enclosures provided.

2.7 TEMPERATURE SENSORS

- A. Duct/Well Sensors:
 - 1. As required by the sequence of operation, provide either 1,000 OHM Balco or 10K OHM Thermistor type sensors. Where the element is used for sensing mixed air or coil discharge temperatures and/or the duct cross-sectional area is in excess of 14 square feet, the element shall be of the averaging type. Where temperature elements are used for sensing liquid temperatures, they shall be furnished with separable stainless steel wells. Provide a Johnson Controls TE-631AM-1 for the probe liquid temperature sensors. Provide a Johnson Controls TE-6316M-1 for the averaging temperature sensors.
- B. Space Sensors:
 - 1. Space temperature sensors shall be Resistance temperature devices (RTD) or thermistor equipped with set point adjustment, override switch, display, and communication port. Provide a Johnson Controls NS-BTB7001.
- C. Binary Temperature Devices:
 - 1. Low-limit thermostats. Low-limit thermostats shall be vapor pressure type with an element 20-foot minimum length. Element shall respond to the lowest temperature sensed by any 1-foot section. The low-limit thermostat shall be manual reset only. Provide a Johnson Controls A70HA-1C.
- D. Analog Current Sensors:
 - 1. As required by the sequence of operation, provide split-core, sensors for indication of equipment amperage. Span shall be adjustable for improved resolution. Current sensors shall incorporate trip indication LEDs and shall be sized for proper operation with equipment they serve. Current sensors and installation to be provided under Work of this Section. Provide a Johnson Controls CSD-SA1E1-1.

- E. Pressure Switches:
 - 1. Differential pressure type switches shall be UL Listed, SPDT snap acting, pilot duty rated, NEMA 4 enclosure, with scale range and differential suitable for intended applications, or as shown. Provide a Johnson Controls DPT2641-005 to measure duct pressure. Provide a Johnson Controls AFS-460 for high and low duct pressure switches.
 - 2. As required by the sequence of operation, provide a differential pressure switch across each air handling unit filter section for unit filter alarm indication. Provide a Johnson Controls P32AC-2C.
- F. Temperature/Humidity Sensors:
 - 1. The humidity and a temperature sensor shall be combined in a single unit as a duct-mount style. The humidity sensor shall be capable of measuring Relative Humidity (RH) over the entire range of 0 to 100 percent. It shall be housed in an all-polymer construction for resistance to chemical corrosion. The sensor shall produce voltage output signals proportional to measured humidity for humidity indication. The temperature sensor shall be thin-film nickel. The sensor shall comply with National Institute of Standards and Technology (NIST). Provide a Johnson Controls HE-67N3-0N00P. Provide a Johnson Controls HE-6703-0N0GO for the outside air humidity sensor.
- G. Air Flow Measuring Stations:
 - 1. Duct Airflow Station: Combination of air straightener and multiport, self-averaging Pitot tube station. The casing shall be a galvanized-steel frame. The flow straightener shall be an aluminum honeycomb, 3/4-inch parallel cell, 3 inches deep. The sensing manifold shall be a copper manifold with bullet-nosed static pressure sensors positioned on equal area basis.

2.8 DDC EQUIPMENT

- A. Workstation Client Hardware Stations: The system shall be capable of supporting at least five clients using a standard Web browser such as Internet Explorer™ or Netscape Navigator™ operating on any standard computer that supports the current version of Internet Explorer™ or Netscape Navigator™.
- B. The web browser shall provide the same view of the system, in terms of graphics, schedules, calendars, logs, etc., and provide the same interface methodology as is provided by the Graphical User Interface. Systems that require different views or that require different means of interacting with objects such as schedules, or logs, shall not be permitted.
- C. The web browser client shall support at a minimum, the following functions:
 - 1. User log-on identification and password shall be required. If an unauthorized user attempts access, a blank web page shall be displayed. Security using Java authentication and encryption techniques to prevent unauthorized access shall be implemented.
 - 2. Graphical screens developed for the GUI shall be the same screens used for the Web browser client. Any animated graphical objects supported by the GUI shall be supported by the Web browser interface.
 - 3. HTML programming shall not be required to display system graphics or data on a Web page. HTML editing of the web page shall be allowed if the user desires a specific look or format.
 - 4. Storage of the graphical screens shall be in the Building Control Units (BC), without requiring any graphics to be stored on the client machine. Systems that require graphics storage on each client are not acceptable.

5. Real-time values displayed on a web page shall update automatically without requiring a manual “refresh” of the web page.
6. Users shall have administrator-defined access privileges. Depending on the access privileges assigned, the user shall be able to perform the following:
7. Modify common application objects, such as schedules, calendars, and set points in a graphical manner.
8. Schedule times will be adjusted using a graphical slider, without requiring any keyboard entry from the operator.
9. Holidays shall be set by using a graphical calendar, without requiring any keyboard entry from the operator.
10. Commands to start and stop binary objects shall be done by right-clicking the selected object and selecting the appropriate command from the pop-up menu.
11. View logs and charts.
12. View and acknowledge alarms.
13. The system shall provide the capability to specify a user (as determined by the log-on user identification) home page. Provide the ability to limit a specific user to just their defined home page. From the home page, links to other views, or pages in the system shall be possible, if allowed by the system administrator.
14. Graphic screens on the web browser client shall support hypertext links to other locations on the Internet or on Intranet sites, by specifying the Uniform Resource Locator (URL) for the desired link.

2.9 CONTROL UNITS GENERAL

- A. Provide an adequate number of control units to achieve monitoring and control of all data points specified and necessary to satisfy the sequence of operation for all mechanical systems shown on the Plans. Provide a minimum of 1 separate controller for each AHU or other HVAC system. Multiple DDC controllers may control one system provided that all points associated with individual control loops are assigned to the same DDC controller. Points used for control loop reset such as outside air or space temperature are exempt from this requirement. Each panel type shall meet the appropriate requirements.
- B. Controllers shall be suitable for the anticipated ambient conditions.
- C. Controllers used outdoors and/or in wet ambient conditions shall be mounted within waterproof enclosures and shall be rated for operation at -40 degrees F to 140 degrees F and 5 to 95 percent RH, non-condensing.
- D. Controllers used in conditioned ambient space shall be mounted in dust-proof enclosures, and shall be rated for operation at 32 degrees F to 122 degrees F and 5 to 95 percent RH, non-condensing.
- E. Serviceability: Provide diagnostic LEDs for power, communication, and processor. All wiring connections shall be made to field-removable, modular terminal strips or to a termination card connected by a ribbon cable.
- F. Memory: The Control Units shall maintain all BIOS and programming information in the event of a power loss for at least 72 hours.
- G. Diagnostics: The Building Controller shall continually check the status of its processor and memory circuits. If an abnormal operation is detected, the controller shall assume a predetermined failure mode and generate an alarm notification.

- H. Immunity to Power and Noise: Controller shall be able to operate at 90 percent to 110 percent of nominal voltage rating and shall perform an orderly shutdown below 80 percent nominal voltage. Operation shall be protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W at 3 feet.
- I. Automatic staggered restart of field equipment after restoration of power and short cycle protection.

2.10 EVENT ALARM NOTIFICATION AND ACTIONS

- A. The NAE shall provide alarm recognition, storage; routing, management, and analysis to supplement distributed capabilities of equipment or application specific controllers.
- B. The NAE shall be able to route any alarm condition to any defined user location whether connected to a local network or remote via dial-up telephone connection, or wide-area network.
- C. Alarm generation shall be selectable for annunciation type and acknowledgement requirements including:
 - 1. To alarm.
 - 2. Return to normal.
 - 3. To fault.
- D. Provide for the creation of a minimum of 8 alarm classes for the purpose of routing types and or classes of alarms, i.e.: security, HVAC, Fire, etc.
- E. Provide timed (schedule) routing of alarms by class, object, group, or node.
- F. Provide alarm generation from binary object "runtime" and /or event counts for equipment maintenance. The user shall be able to reset runtime or event count values with appropriate password control.
- G. Control equipment and network failures shall be treated as alarms and annunciated.
- H. Alarms shall be annunciated in any of the following manners as defined by the user.
- I. Email of the complete alarm message to multiple recipients. Provide the ability to route and email alarms based on:
 - 1. Day of week.
 - 2. Time of day.
 - 3. Recipient.
- J. Pagers via paging services that initiate a page on receipt of email message.
- K. The following shall be recorded by the NAE for each alarm (at a minimum):
 - 1. Time and date.
 - 2. Location (building, floor, zone, office number, etc.).
 - 3. Equipment (air handler #, accessway, etc.).
 - 4. Acknowledge time, date, and user who issued acknowledgement.
 - 5. Number of occurrences since last acknowledgement.
- L. Alarm actions may be initiated by user defined programmable objects created for that purpose.
- M. Defined users shall be given proper access to acknowledge any alarm, or specific types or classes of alarms defined by the user.
- N. Provide a "query" feature to allow review of specific alarms by user defined parameters.
- O. A separate log for system alerts (controller failures, network failures, etc.) shall be provided and available for review by the user.
- P. An Error Log to record invalid property changes or commands shall be provided and available for review by the user.

2.11 DATA COLLECTION AND STORAGE

- A. The NAE shall have the ability to collect data for any property of any object and store this data for future use.
- B. The data collection shall be performed by log objects, resident in the NAE that shall have, at a minimum, the following configurable properties:
 - C. Designating the log as interval or deviation.
 - D. For interval logs, the object shall be configured for time of day, day of week, and the sample collection interval.
 - E. For deviation logs, the object shall be configured for the deviation of a variable to a fixed value. This value, when reached, will initiate logging of the object.
 - F. For all logs, provide the ability to set the maximum number of data stores for the log and to set whether the log will stop collecting when full, or rollover the data on a first-in, first-out basis.
 - G. Each log shall have the ability to have its data cleared on a time-based event or by a user-defined event or action.
 - H. All log data shall be stored in a relational database in the NAE and the data shall be accessed from a server (if the system is so configured) or a standard Web Browser.
 - I. All log data, when accessed from a server, shall be capable of being manipulated using standard SQL statements.
 - J. All log data shall be available to the user in the following data formats:
 - 1. HTML.
 - 2. XML.
 - 3. Plain text.
 - 4. Comma or tab separated values.
 - K. Systems that do not provide log data in HTML and XML formats at a minimum shall provide as an alternative Microsoft SQL Server®, Oracle 8i or Express®, Hyperion Solutions™ SQL Server.
 - L. The NAE shall have the ability to archive log data either locally, or remotely to a server or other NAE on the network. Provide the ability to configure the following archiving properties, at a minimum:
 - 1. Archive on time of day.
 - 2. Archive on user-defined number of data stores in the log (buffer size).
 - 3. Archive when log has reached its user-defined capacity of data stores.
 - 4. Provide ability to clear logs once archived.

2.12 AUDIT LOG

- A. Provide and maintain an Audit Log that tracks all activities performed on the NAE. Provide the ability to specify a buffer size for the log and the ability to archive log based on time or when the log has reached its user-defined buffer size. Provide the ability to archive the log locally (to the NAE), to another NAE on the network, or to a server. For each log entry, provide the following data:
 - 1. Time and date.
 - 2. User ID.
 - 3. Change or activity: i.e., Change setpoint, add or delete objects, commands, etc.

2.13 DATABASE BACKUP AND STORAGE

- A. The NAE shall have the ability to automatically backup its database. The database shall be backed up based on a user-defined time interval.
- B. Copies of the current database and, at the most recently saved database shall be stored in the NAE and in the primary server. The age of the most recently saved database is dependent on the user-defined database save interval.
- C. The NAE database shall be stored, at a minimum, in XML format to allow for user viewing and editing, if desired. Other formats are acceptable as well, as long as XML format is supported.

2.14 PROGRAMMABLE CONTROLLERS

- A. Provide Johnson Controls FEC module with display.
- B. Standalone DDC panels shall be microprocessor-based, multi-tasking, multi-user, real-time digital control processors. Each standalone DDC panel shall consist of modular hardware with plug-in enclosed processors, communication controllers, power supplies, and input/output modules. A sufficient number of controllers shall be supplied to fully meet the requirements of this Specification and the attached point list.

2.15 TSI PRESSURE MONITORS

- A. TSI pressure monitors shall be TSI-8630PM with a BACnet interface.
- B. The room pressure monitor system shall measure the pressure differential between the room and reference space. The room pressure sensor shall have a resolution of 5 percent of the measured value and shall detect any change in the room pressure within 0.1 second, with a minimum reading of 0.0001 inches H₂O. Room pressure is to be monitored for positive pressure, OR #8 to maintain minimum 0.01-inch wg. with respect to adjacent rooms.
- C. Local audible and visual alarms and relay contacts shall be enabled whenever either measured room pressure differential falls below its user configurable low alarm set point or rises above its user configurable high alarm set point, after a configurable delay. The primary and secondary pressure sensors shall have individual alarm set points. A mute key shall temporarily silence the audible alarm for a user configured delay. Manual or automatic reset of the alarms shall be configurable.
- D. Calibration of room pressure differential and air flow shall be done electronically through the use of the integral keypad. Calibration shall consist of adjusting the sensor zero point and sensor span to match a reference measurement. Password protection of the calibration items shall limit unauthorized access. Neither remote calibration nor calibrating through the use of potentiometers is acceptable.

PART 3 - EXECUTION

3.1 INSTALLATION AND WORKMANSHIP

- A. Install equipment, piping and wiring raceway parallel to the building lines (i.e., horizontal, vertical and parallel to walls) wherever possible.
- B. Provide sufficient slack and flexible connections to allow for vibration of piping and equipment.
- C. Install all equipment in readily accessible locations as defined by Chapter 1, Article 100, Part A of the National Electric Code (NEC).

- D. Verify integrity of all wiring to ensure continuity and freedom from shorts and grounds.
- E. All equipment, installation and wiring shall comply with acceptable industry specifications and standards for performance, reliability and compatibility and be executed in strict adherence to local codes and standard practices.

3.2 ELECTRICAL INTERLOCKS

- A. All electrical interlocks shall be provided as specified. All electrical interlocks shall be made by means of motor starters or shall be accomplished by separate relays. No motor power lead shall be utilized in an interlock circuit. All interlocked starters with disconnect switches shall be provided with auxiliary contacts on the disconnect switch so that interlocking circuits are interrupted when the disconnect switch is in the off position.

3.3 OWNERSHIP OF PROPRIETARY MATERIAL

- A. Owner shall sign a copy of the manufacturer standard software and firmware licensing agreement as a condition of this Contract. Such license shall grant use of all programs and application software to Owner as defined by the manufacturer's license agreement, but shall protect manufacturer's rights to disclosure of trade secrets contained within such software. All Project-developed software and documentation shall become the property of the Owner. These include, but are not limited to Project graphic images, Record Drawings, Project database, Project-specific application programming code, and all other associated documentation.

3.4 SEQUENCES

- A. Refer to DDC Drawings for Sequence of Operations

END OF SECTION

SECTION 23 31 00 – HVAC DUCTS AND CASINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Duct Materials.
 - 2. Flexible metal insulated ductwork.
 - 3. Single wall spiral round ducts.
 - 4. Transverse duct connection system.
 - 5. Casings.
 - 6. Ductwork fabrication.
 - 7. Duct cleaning.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
- C. Note: Contractor must perform duct pressurization tests on all existing and new ductwork serving the existing AHU-2 unit. Refer to Owner-contracted commissioning agent for testing phases and documentation with testing results to be submitted with close-out documents. Contractor to refer to schedule at the end of this Section and Owner-contracted commissioning agent requirements.

1.2 REFERENCES

- A. American Society for Testing and Materials:
 - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
 - 2. ASTM A90 - Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
 - 3. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - 4. ASTM A366 - Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
 - 5. ASTM A568 - Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
 - 6. ASTM A569 - Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial Quality.
 - 7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 8. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 9. ASTM C14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.
 - 10. ASTM C443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
 - 11. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

- B. National Fire Protection Association:
 - 1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.
 - 2. NFPA 90B - Standard for the Installation of Warm Air Heating and Air Conditioning Systems.
 - 3. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- C. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA - Fibrous Glass Duct Construction Standards.
 - 2. SMACNA - HVAC Air Duct Leakage Test Manual.
 - 3. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
 - 4. SMACNA - US Duct Leakage Testing Requirements.
- D. Underwriters Laboratories Inc.:
 - 1. UL 181 - Factory-Made Air Ducts and Connectors.

1.3 PERFORMANCE REQUIREMENTS

- A. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.4 SUBMITTALS

- A. Shop Drawings: Submit duct fabrication drawings, drawn to scale not smaller than 1/8-inch equals 1 foot, on Drawing sheets same size as Contract Documents, indicating:
 - 1. Fabrication, assembly, and installation details, including Plans, elevations, Sections, details of components, and attachments to other work.
 - 2. Duct layout, indicating pressure classifications and sizes in Plan view. For exhaust duct systems, indicate classification of materials handled as defined in this Section.
 - 3. Fittings.
 - 4. Reinforcing details and spacing.
 - 5. Seam and joint construction details.
 - 6. Penetrations through fire rated and other walls.
 - 7. Terminal unit, coil, and humidifier installations.
 - 8. Hangers and supports, including methods for building attachment, vibration isolation, and duct attachment.
- B. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.

1.5 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards: Metal and flexible.
- B. Construct ductwork to NFPA 90A, NFPA 90B and NFPA 96 standards.
- C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 3 years documented experience.
- B. Installer: Company specializing in performing Work of this Section with minimum 3 years documented experience.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures during and after installation of duct sealant.

1.9 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.10 WARRANTY

- A. Furnish 1-year manufacturer warranty for ducts.

PART 2 - PRODUCTS

2.1 DUCT MATERIALS

- A. Galvanized Steel Ducts: ASTM A653 galvanized steel sheet, lock-forming quality, having G60 zinc coating of in conformance with ASTM A90.
- B. Fasteners: Rivets, bolts, or sheet metal screws.
- C. Hanger Rod: ASTM A36; steel, galvanized; threaded both ends, threaded 1-end, or continuously threaded.

2.2 FLEXIBLE METAL INSULATED DUCTWORK

- A. Manufacturer:
 - 1. Flexmaster – Model TL-M.
 - 2. Substitutions: Refer to Section 23 05 00 “General Mechanical Requirements.”
- B. Insulation: ASTM C553; flexible, noncombustible blanket.
 - 1. ‘K’ (‘Ksi’) value: ASTM C518, 0.31 at 75 degrees F.
 - 2. Maximum service temperature: 250 degrees F.
 - 3. Maximum moisture absorption: 0.20 percent by volume.
 - 4. Minimum “R” value: 6.0 (h · ft²)/Btu.
 - 5. ASTM E96, UL 181, Class 1 Air Duct and NFPA 90A and 90B Rated.
 - 6. Maximum pressure rating 10-inch wg.
 - 7. Flame/smoke 25/50 rated.
- C. Vapor Barrier Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film 0.0032-inch vinyl.
 - 2. Moisture vapor transmission: ASTM E96; 0.02 perm.
 - 3. Secure with pressure sensitive tape.

2.3 SINGLE WALL SPIRAL ROUND DUCTS

- A. Product Description: UL 181, Class 1, round spiral lockseam duct constructed of galvanized steel.
- B. Construct duct with the following minimum gauges:

Diameter	Gauge
3 inches to 26 inches	22
28 inches to 50 inches	20
52 inches to 84 inches	18

- C. Construct fittings with the following minimum gauges:

Diameter	Gauge
3 inches to 26 inches	22
28 inches to 36 inches	20
38 inches to 50 inches	20
52 inches to 60 inches	18
62 inches to 84 inches	16

2.4
2.4
2.4
2.4

2.4 TRANSVERSE DUCT CONNECTION SYSTEM

- A. Product Description: SMACNA E-rated or J-rated rigidity class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips.

2.5 CASINGS

- A. Fabricate casings in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and construct for operating pressures indicated.
- B. Reinforce access door frames with steel angles tied to horizontal and vertical plenum supporting angles. Furnish hinged access doors where indicated or required for access to equipment for cleaning and inspection. Furnish duct access doors at each motorized or actuator operated damper, where shown or not shown on the Drawings.

2.6 DUCTWORK FABRICATION

- A. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify sizes of equipment connections before fabricating transitions.

3.2 INSTALLATION

- A. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. Install glass fiber ducts in accordance with SMACNA Fibrous Glass Duct Construction Standards. Obtain manufacturer's inspection and acceptance of fabrication and installation at beginning of installation.
- C. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- D. Install duct hangers and supports in accordance with manufacturer's recommendation.
- E. Use double nuts and lock washers on threaded rod supports.
- F. Connect flexible ducts to metal ducts with liquid adhesive plus tape.
- G. Contractor shall perform duct pressurization tests on completed sections of ductwork as designated by Project commissioning agent. Once commissioning agent has approved duct sealant test results, mechanical contractor may proceed with ductwork installation, as per commissioning agent direction.

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Install openings in ductwork where required to accommodate thermometers and controllers. Install Pitot tube openings for testing of systems. Install Pitot tube complete with metal can with spring device or screw to prevent air leakage. Where openings are provided in insulated ductwork, install insulation material inside metal ring.
- B. Connect diffusers to low pressure ducts directly or with 3 feet maximum length of flexible duct held in place with strap or clamp.

3.4 CLEANING

- A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air flow, clean half of system completely before proceeding to other half. Protect equipment with potential to be harmed by excessive dirt with temporary filters, or bypass during cleaning.
- B. Clean duct systems with high power vacuum machines. Protect equipment with potential to be harmed by excessive dirt with filters, or bypass during cleaning. Install access openings into ductwork for cleaning purposes.

3.5 SCHEDULES

- A. Ductwork Pressure Class Schedule

AIR SYSTEM	PRESSURE CLASS
Supply Duct	2 inch wg
Return Duct	2 inch wg regardless of velocity.
General Exhaust Duct	2 inch wg regardless of velocity.

B. Ductwork Leakage Class Schedule

DUCT CLASS	1/2-, 1-, 2-inch wg
SEAL CLASS	C
SEALING APPLICABLE	Transverse joint only
LEAKAGE CLASS (C_L) – CFM LEAKAGE PER 100ft² @ 1 IN H₂O	
RECTANGULAR METAL	24
ROUND METAL	12

$$F = C_L * P^{0.65}$$

F = Maximum leakage (CFM/100ft²)

C_L = Leakage class (from table)

P = Pressure (in H₂O)

END OF SECTION

SECTION 23 33 00 – AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Duct access doors.
 - 2. Volume control dampers.
 - 3. Duct test holes.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. National Fire Protection Association:
 - 1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.
 - 2. NFPA 92A - Recommended Practice for Smoke-Control Systems.
- B. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
- C. Underwriters Laboratories Inc.:
 - 1. UL 33 - Heat Responsive Links for Fire-Protection Service.
 - 2. UL 555 - Fire Dampers.
 - 3. UL 555S - Leakage Rated Dampers for Use in Smoke Control Systems.

1.3 SUBMITTALS

- A. Section 01 33 00 “Submittal Procedures”: Submittal procedures.
- B. Manufacturer's Installation Instructions: Submit for Fire and Combination Smoke and Fire Dampers.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit for Combination Smoke and Fire Dampers.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with Municipality of Lubbock, Texas standard.
- B. Maintain 1 copy of each document on site.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 3 years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect dampers from damage to operating linkages and blades.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.9 COORDINATION

- A. Coordinate Work where appropriate with building control Work.

1.10 WARRANTY

- A. Furnish 1-year manufacturer warranty for duct accessories.

PART 2 - PRODUCTS

2.1 DUCT ACCESS DOORS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. Fabrication: Rigid and close fitting of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, furnish minimum 1-inch-thick insulation with sheet metal cover.
 - 1. Less Than 12 inches square, secure with sash locks.
 - 2. Up to 18 inches Square: Furnish 2 hinges and 2 sash locks.
 - 3. Up to 24 x 48 inches: 3 hinges and 2 compression latches with outside and inside handles.
 - 4. Access panels with sheet metal screw fasteners are not acceptable.

2.2 VOLUME CONTROL DAMPERS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. Splitter Dampers:
 - 1. Material: Same gauge as duct to 24 inches size in both dimensions, and 2 gauges heavier for sizes over 24 inches.
 - 2. Blade: Fabricate of double thickness sheet metal to streamline shape, secured with continuous hinge or rod.
 - 3. Stand-Off Operator: Minimum 1/4-inch-diameter rod in self aligning, universal joint action, flanged bushing with set screw.
 - 4. Single Blade Dampers: Fabricate for duct sizes up to 6- x 30-inch.
- C. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8- x 72-inch. Assemble center and edge crimped blades in prime coated or galvanized frame channel with suitable hardware.
- D. End Bearings: Except in round ductwork 8 inches and smaller, furnish end bearings. On multiple blade dampers, furnish oil-impregnated nylon or sintered bronze bearings. Furnish closed end bearings on ducts having pressure classification over 2 inches wg.
- E. Quadrants:
 - 1. Furnish locking, indicating quadrant regulators on single and multi-blade dampers.
 - 2. On insulated ducts mount quadrant regulators on standoff mounting brackets, bases, or adapters.
 - 3. Where rod lengths exceed 30 inches furnish regulator at both ends.

2.3 DUCT TEST HOLES

- A. Permanent Test Holes: Factory fabricated, airtight flanged fittings with screw cap. Furnish extended neck fittings to clear insulation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify rated walls are ready for fire or smoke damper installation.
- B. Verify ducts and equipment installation are ready for accessories.
- C. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

3.2 INSTALLATION

- A. Install in accordance with NFPA 90A and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 23 31 00 "HVAC Ducts and Casings" for duct construction and pressure class.
- B. Install permanent duct test holes where required for testing and balancing purposes.

END OF SECTION

SECTION 23 37 13 - DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ceiling- and wall-mounted diffusers, registers, and grilles.
 - 2. Laminar flow operating room supply air diffusers.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 SUBMITTALS

- A. Product Data: For each product indicated, include the following:
 - 1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
 - 2. Diffuser, Register, and Grille Schedule: Indicate Drawing designation, room location, quantity, model number, size, and accessories furnished.
- B. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
 - 1. Ceiling suspension assembly members.
 - 2. Method of attaching hangers to building structure.
 - 3. Size and location of initial access modules for acoustical tile.
 - 4. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - 5. Duct access panels.
- C. Samples for Initial Selection: For diffusers, registers, and grilles with factory-applied color finishes.
- D. Samples for Verification: For diffusers, registers, and grilles, in manufacturer's standard sizes to verify color selected.

PART 2 - PRODUCTS

2.1 GRILLES AND REGISTERS

- A. Refer to Air Distribution Schedule on Drawings for grill and register details.

2.2 LAMINAR FLOW OPERATING ROOM SUPPLY AIR DIFFUSERS

- A. Manufacturers:
 - 1. Price Industries, Inc., Model LFD "Basis of Design."
 - 2. Nailor Industries, Model 92LFD.
 - 3. Titus, Model TLF.
- B. General:
 - 1. The laminar flow diffusers shall be non-aspirating, unidirectional type, providing a uniform vertical projection of air at controlled low velocities and minimal entrainment of room air, satisfying the requirements of ASHRAE Standard 170.
 - 2. Plenum material shall be 304 Stainless steel.

3. Face and frame material shall be one of the following options 304 stainless steel, continuously welded.
4. Plenum shall be divided into an upper and lower chamber utilizing an internal pressure equalization baffle to promote uniform face velocity. Air shall be admitted to the top plenum chamber through an inlet collar, the diffuser plenum shall feature 4 integral hanger tabs for securing the unit to structural supports above the ceiling. Mounting frames shall utilize corner alignment brackets. The 13 percent free-area perforated distribution plate shall be secured to the face using stainless steel quarter-turn fasteners with anti-slip, snap-in retainers and stainless steel retainer cables for ease of installation and removal.
5. Stainless steel plenums shall have a mill finish.
6. External Insulation: The diffuser plenum shall be externally insulated with 1-inch aluminum foil-backed fiberglass insulation, shall not contain formaldehyde, insulation and adhesive surface burning characteristics shall have a maximum flame/smoke spread of 25/50 when tested in accordance with ASTM E84. Secure insulation with adhesive. Coat edges exposed to airstream with NFPA 90A approved sealant. Insulation shall meet the requirements of ASTM-84 and UL 723.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practicable. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire, fire/smoke, or smoke dampers.

3.3 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION

SECTION 26 05 00 - BASIC ELECTRICAL METHODS

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REQUIREMENTS OF REGULATORY AGENCIES AND STANDARDS

- A. Regulatory Agencies: Installation, materials, equipment, and workmanship shall conform to the applicable provisions of the following:
 - 1. National Electrical Code (NEC).
 - 2. National Electrical Safety Code (NESC).
 - 3. Terms and conditions of the electrical utility and other authorities having lawful jurisdiction pertaining to the Work required.
 - 4. Texas Department of State Health Services (TDSHS) June 2020 Edition.
 - 5. National Fire Protection Association (NFPA) NFPA-99 Health Care Facilities.
- B. All temperature control wiring and associated conduit and boxes, shall be provided under other Sections of the Specifications. All power and control wiring not identified under Division 23, shall be provided under Division 26. Division 26 requirements include power wiring for smoke dampers and 120-volt power for mechanical equipment control equipment at all locations where required. It shall be the responsibility of the Electrical Contractor to coordinate for all locations requiring such power.
- C. The Work covered by Division 26 of the Specifications includes the furnishing of all materials, labor, transportation, tools, permits, and fees for the complete installation of all electrical Work required in the Contract Drawings.
- D. In the event that additional or special construction is required, the Contractor is responsible for providing all material and equipment which are usually furnished with such construction in order to complete the installation, whether indicated or not.
- E. The Contractor shall familiarize himself with the existing conditions of the site and advise the Architect of any discrepancy or conflict prior to Bidding.
- F. The Contractor shall be responsible for all permits, fees, and licenses required for the Project. All cost of such permits or fees shall be included in the Bid.
- G. All equipment and material shall be installed in accordance with the applicable manufacturer's recommendations and standards.
- H. Install sleeves, sealant pans, and roof penetrations as required for the installation of the electrical Work. All such Work is subject to the approval of the Architect.

1.3 SUBMITTALS

- A. The intent of this Section is to give general submittal information, refer to specific submittal information in the subsequent Sections.
- B. Within 10 days after award of the Contract, and before orders are placed, Contractor shall submit specific information on list of equipment and principal materials specified. Contractor shall indicate and/or provide names of manufacturers, catalog and model numbers, cut sheets, and such other supplementary information as necessary for evaluation. Minimum of 6 copies, or as directed by the Architect, of each shall be submitted and shall include all items mentioned by model number and/or manufacturer's name in the Specifications or in schedules on the Drawings.
- C. Requirements for each submittal:
 - 1. Bear a dated stamp or specific written indication that the Contractor has reviewed and approved all submittal prior to submission to Architect.
 - 2. Have all information deleted by Contractor that pertains to the means and methods of construction or to fabrication, assembly, installation, or erection (approval by Architect shall not extend to these areas unless specifically noted by Architect).
 - 3. Be clearly and SPECIFICALLY marked as to which specific piece of equipment is being submitted, by use of a permanent marker, stamp, etc., so as to distinguish it from other pieces of equipment that may occur on the same page.
 - 4. Be clearly marked as to which available options are being submitted that are associated with a piece of equipment.
 - 5. Be complete with respect to quantities, dimensions, specific performance, materials, and similar data to enable the Architect to review the proposed equipment.
 - 6. Division 26 submittals shall be submitted at the same time as a single package. Fire Alarm submittals may be submitted separately.
- D. Omission by Contractor of any of the above requirements or submittals will subject submittal to automatic rejection without review.
- E. Submittals received by Architect not requested shall be returned without review of any kind.

PART 2 - PRODUCTS

2.1 EQUIPMENT REQUIREMENTS

- A. The electrical requirements for equipment specified or indicated on the Drawings are based on information available at the time of design. If equipment furnished for installation has electrical requirements other than indicated on the Electrical Drawings, the Contractor shall make any required changes to wire and conduit size, controls, overcurrent protection, and installation as required to accommodate the equipment supplied, without additional charge to the Owner. The complete responsibility and costs for such adjustments shall be assigned to the respective Section of this Specification under which the equipment is furnished.

2.2 MATERIALS

- A. All similar materials and equipment shall be the product of the same manufacturer unless specified otherwise.
- B. Materials and equipment shall be the standard products of manufacturers regularly engaged in the production of such material and shall be the manufacturer's current and standard design.
- C. Altitude: Equipment affected by altitude shall perform satisfactorily for the function intended at the altitude of the Project site.

PART 3 - EXECUTION

3.1 GENERAL

- A. Fabrication, erection, and installation of the complete electrical system shall be done in accordance with accepted good practice by qualified personnel experienced in such Work and shall proceed in an orderly manner so as not to impede the progress of the Project. The Electrical Contractor shall check all areas and surfaces where electrical equipment or material is to be installed, removed, or relocated and report any unsatisfactory conditions before starting Work. Commencement of Work signifies this Contractor's acceptance of existing conditions. In the acceptance or rejection of the finished installation, no allowance will be made for lack of skill on the part of workmen. Surfaces requiring coatings will be completed prior to installation of any electrical Work on these surfaces.
- B. The Electrical Drawings are diagrammatic. The installation requirements shall be carefully coordinated with structural, architectural, and mechanical conditions and shall be adjusted to avoid conflict.
- C. All Work shall be concealed in walls, ceilings, chases unless specifically noted to be exposed or otherwise approved.
- D. The locations of electrical equipment is approximate and are not intended to convey the exact details and mounting of location of outlets, equipment and other items. Exact locations are to be field determined by actual measurements.
- E. Consult the Architectural Drawings to determine wall finishes and locations of wall mounted equipment, counter top splashes and similar items to avoid conflict with electrical equipment.
- F. Provide for the 120V power and fire alarm connections to the fire smoke dampers. Provide a toggle switch disconnect for each damper. Refer to the mechanical Drawings for locations. Connect a maximum of 5 dampers per circuit. Connect to 20A/1P spare breakers on the critical branch.
- G. Refer to the medical gas piping plans for locations of the alarm panels. Provide for all 120-volt power requirements. Circuit and connect to the hospital life safety branch of the essential electrical system.
- H. Part of this Project will include the installation of conduits, boxes, pullstrings, and other pathways to provide pathways for the Owner installed data and phone cabling.

3.2 PERFORMANCE TESTS

- A. Thoroughly test all control circuits, fixtures, services and all circuits for proper operating condition and freedom from grounds and short circuits before acceptance is requested. All equipment, appliances and devices shall be operated under load conditions.
- B. After the interior wiring system installation is complete conduct operating tests for approval. When requested, test all the wire, cable, devices, and equipment after installation, to assure that all material continues to possess all the original characteristics as required by governing codes and standards listed in these Specifications.
- C. After motor operation has been verified make voltage readings at all panelboards and starters. Based on these readings, make final adjustments of primary taps on all transformers in the building as directed, or coordinate with the utility proper building voltage.
- D. Perform such other tests as required by other Sections of these Specifications or as requested to prove acceptability.
- E. Furnish all instruments and labor for testing.
- F. All material installed shall be listed, inspected, and approved by a nationally accepted testing laboratory such as UL and/or ETL. All material shall bear the UL or ETL label where available.
- G. The Contractor shall include all labor and material necessary to assist the Owner in the 80 percent and 100 percent testing and walk-through meetings with TDSHS.

3.3 SUBMITTAL AND APPROVAL OF MATERIALS

- A. All requirements for submittals shall comply with the applicable provisions included in the individual Specification Sections.
- B. Unless identified as a sole source item, the listing of product manufacturers, catalog numbers, etc., on the Drawings is intended to establish a standard of quality of the product. It is the responsibility of the Contractor to review all items he intends to submit. If equipment other than that indicated on Drawings is proposed by the Contractor, the information will be reviewed at the time of the submission of the submittal.
- C. As a part of the submittal process the Contractor shall provide a coordination study, fault current study, and an arc flash study of all new overcurrent devices and the electrical system as it relates to this Project. This shall be performed by the switchgear manufacturer and shall be presented in report form for review by the Architect. This coordination study shall include recommended settings for all overcurrent devices.
- D. Refer to Specification Section 26 05 26 "Grounding and Bonding" for additional grounding reports that are required.

3.4 PROJECT PHASING

- A. The Contractor shall make himself familiar with all construction documents associated with this Project and clearly adhere to the phasing requirements and Work restrictions stated herein.
- B. Contractor shall be responsible for maintaining permanent power to all locations that are required to remain occupied. Outages for other areas shall be coordinated with the Owner. Any temporary provisions required to provide temporary power shall be included in the Bid.

3.5 WORK IN EXISTING BUILDING

- A. Part of the Work associated with this Project includes demolition and remodel Work within proximity of an existing facility.

END OF SECTION

SECTION 26 05 05 - SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Sections Includes:
 - 1. Removal of existing electrical equipment, wiring, and conduit in areas to be remodeled; removal of designated construction; dismantling, cutting, and alterations for completion of the Work.
 - 2. Disposal of materials.
 - 3. Storage of removed materials.
 - 4. Identification of utilities.
 - 5. Salvaged items.
 - 6. Protection of items to remain.
 - 7. Relocate existing equipment to accommodate construction.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 COORDINATION

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Coordinate demolition Work with general contractor.
- C. Coordinate and sequence demolition so as not to cause shutdown of operation of surrounding areas.
- D. Shut-down Periods:
 - 1. Coordinate in advance with A/E, Owner, and Construction Manager.
 - 2. Power for equipment supplying heat shall be maintained at all times unless outage approved by Construction Manager.
- E. Identify salvage items in cooperation with Owner.
- F. Provide temporary lighting to uniform 15-foot candles, if not provided by natural lighting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify wiring and equipment indicated to be demolished serve only abandoned facilities.
- B. Verify termination points for demolished services.

3.2 PREPARATION

- A. Erect and maintain temporary safeguards, including warning signs and lights, barricades, and similar measures, for protection of the public, Contractor's employees, and existing improvements to remain.
- B. Temporary egress signage and emergency lighting as required.

3.3 DEMOLITION

- A. Demolition Drawings are based on field observation and existing record documents. Report discrepancies to A/E before disturbing existing installation.
- B. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- C. Remove conduit, wire, boxes, and fastening devices to avoid any interference with new installation.
- D. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- E. Reconnect equipment being disturbed by renovation Work and required for continued service to power panel currently serving the load or nearest available panel.
- F. Disconnect or shut off service to areas where electrical work is to be removed. Remove electrical fixtures, equipment, and related switches, outlets, conduit, and wiring which are not part of final Project.
- G. Install temporary wiring and connections to maintain existing systems in service during construction.
- H. Remove, relocate, and extend existing installations to accommodate new construction.
- I. Repair adjacent construction and finishes damaged during demolition and extension Work.
- J. Remove exposed abandoned grounding and bonding components, fasteners and supports, and electrical identification components, including abandoned components above accessible ceiling finishes. Cut embedded support elements flush with walls and floors.
- K. Clean and repair existing equipment to remain or to be reinstalled.
- L. Protect and retain power to existing active equipment remaining.
- M. Cap abandoned empty conduit at both ends.

3.4 EXISTING PANELBOARDS

- A. Ring out circuits in existing panel affected by the Work. Where additional circuits are needed, reuse circuits available for reuse. Install new breakers where required.
- B. Tag unused circuits as spare.
- C. Where existing circuits are indicated to be reused, use sensing measuring devices to verify circuits feeding Project area or are not in use.
- D. Remove existing wire no longer in use from panel to equipment.
- E. Provide new updated directories where more than three circuits have been modified or rewired.
- F. Provide power to the fire alarm control panels and remote power supplies as required. Provide power from the existing power panels. All new circuit breakers shall match the existing.

3.5 SALVAGE ITEMS

- A. Remove and protect items indicated on Drawings to be salvaged and returned to Owner. The Owner shall retain the first right of refusal of all removed equipment. Where the Owner does not desire salvaged equipment, the Contractor shall remove and properly dispose of such equipment.
- B. Items of salvageable value may be removed as work progresses. Transport salvaged items from site as they are removed.

3.6 CLEANING

- A. Remove demolished materials as Work progresses. Legally dispose.
- B. Keep workplace neat.

3.7 PROTECTION OF FINISHED WORK

- A. Do not permit traffic over unprotected floor surface.

END OF SECTION

SECTION 26 05 13 - BUILDING WIRE AND CABLE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Building wire and cable.
 - 2. Wiring connectors and connections.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 26 05 53 "Electrical Identification."

1.2 REFERENCES

- A. Section 01 40 00 "Quality Requirements": References and standards.
- B. NECA - Standard of Installation.
- C. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association).
- D. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS FOR REVIEW

- A. Section 01 33 00 "Submittal Procedures": Procedures for submittals.
- B. Product Data: Provide for each cable assembly type.

1.4 SUBMITTALS FOR INFORMATION

- A. Section 01 33 00 "Submittal Procedures": Procedures for submittals.
- B. Test Reports: Indicate procedures and values obtained.
- C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

1.5 SUBMITTALS AT PROJECT CLOSEOUT

- A. Section 01 70 00 "Execution and Closeout Requirements": Procedures for submittals.
- B. Project Record Documents: Record actual locations of components and circuits.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 3 years documented experience.

1.7 REGULATORY REQUIREMENTS

- A. Conform to NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.8 PROJECT CONDITIONS

- A. Section 01 30 00 “Administrative Requirements.”
- B. Verify that field measurements are as indicated.
- C. Conductor sizes are based on copper.
- D. Wire and cable routing indicated is approximate unless dimensioned.

1.9 COORDINATION

- A. Coordinate Work under provisions of Section 01 30 00 “Administrative Requirements.”
- B. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths shall be provided as required.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

- A. Manufacturers:
 - 1. American Cable.
 - 2. Houston Wire and Cable.
 - 3. Southwire.
 - 4. Substitutions: Refer to Section 01 60 00 “Product Requirements.”
- B. Description: Single conductor insulated wire.
- C. Conductor: Copper.
- D. Insulation Voltage Rating: 600 volts.
- E. Insulation: NFPA 70, Type indicated herein. All ampacity ratings shall be based on 75 degrees C rating.
- F. MC Cable: Shall not be utilized on this Project.

2.2 WIRING CONNECTORS

- A. Split Bolt Connectors:
 - 1. Buchanan.
 - 2. Burndy.
 - 3. IlSCO.
 - 4. Substitutions: Refer to Section 01 60 00 “Product Requirements.”
- B. Solderless Pressure Connectors:
 - 1. Buchanan.
 - 2. Burndy.
 - 3. IlSCO.
 - 4. Substitutions: Refer to Section 01 60 00 “Product Requirements.”
- C. Spring Wire Connectors:
 - 1. Ideal.
 - 2. Substitutions: Refer to Section 01 60 00 “Product Requirements.”
- D. Compression Connectors:
 - 1. Buchanan.
 - 2. Burndy.
 - 3. IlSCO.
 - 4. Substitutions: Refer to Section 01 60 00 “Product Requirements.”

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 “Administrative Requirements”: Verification of existing conditions before starting Work.
- B. Verify that interior of building has been protected from weather.
- C. Verify that mechanical Work likely to damage wire and cable has been completed.
- D. Verify that raceway installation is complete and supported.

3.2 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

3.3 WIRING METHODS

- A. All Locations: Use only building wire, Type THW or THHN/THWN insulation, in raceway.
- B. Use wiring methods indicated.

3.4 INSTALLATION

- A. Section 01 40 00 “Quality Requirements”: Manufacturer's instructions.
- B. Route wire and cable as required to meet Project Conditions.
- C. Install cable in accordance with the NECA - Standard of Installation.
- D. Use solid conductor for feeders and branch circuits 10 AWG and smaller.
- E. Use conductor not smaller than 12 AWG for power and lighting circuits with the exception of pre-manufactured fixture whips, listed for such use and not exceeding 6 feet in length.
- F. Use conductor not smaller than 14 AWG for control circuits except as indicated on Drawings.
- G. Use 10 AWG conductors for 20 ampere, branch circuits longer than 100 feet and as indicated on the Drawings.
- H. Install all conductors in conduit.
- I. Pull all conductors into raceway at same time.
- J. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
- K. Protect exposed cable from damage.
- L. All cables shall be neatly supported.
- M. Use suitable cable fittings and connectors.
- N. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- O. Clean conductor surfaces before installing lugs and connectors.
- P. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- Q. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
- R. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
- S. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
- T. Identify and color code wire and cable under provisions of Section 26 05 53 “Electrical Identification.” Identify each conductor with circuit number or other designation indicated.

- U. The number of conductors in each conduit run shall be limited to the requirements as indicated on the Drawings and indicated in Article 310 of the National Electrical Code (i.e., no more than 4 current carrying conductors, including the grounded conductor in a single home run).
- V. Provide a dedicated neutral (grounded conductor) for all phase-to-ground branch circuits. This will negate the requirement of opening all phase conductors simultaneously.

3.5 FIELD QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements": Field inspection, testing and adjusting.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

END OF SECTION

SECTION 26 05 19 - EQUIPMENT WIRING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Electrical connections to equipment specified under other Sections.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 26 05 00 "Basic Electrical Methods."

1.2 REFERENCES

- A. NEMA WD 1 - General Purpose Wiring Devices.
- B. NEMA WD 6 - Wiring Device Configurations.
- C. ANSI/NFPA 70 - National Electrical Code.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 "Submittal Procedures."
- B. Product Data: Provide wiring device manufacturer's catalog information showing dimensions, configurations, and construction.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

1.4 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.5 COORDINATION

- A. Coordinate Work under provisions of Section 01 30 00 "Administrative Requirements."
- B. Obtain and review Shop Drawings, product data, and manufacturer's instructions for equipment furnished under other Sections.
- C. Determine connection locations and requirements.
- D. Sequence rough-in of electrical connections to coordinate with installation schedule for equipment.
- E. Sequence electrical connections to coordinate with start-up schedule for equipment.

PART 2 - PRODUCTS

2.1 CORDS AND CAPS

- A. Attachment Plug Construction: Conform to NEMA WD 1.
- B. Configuration: NEMA WD 6; match receptacle configuration at outlet provided for equipment.

- C. Cord Construction: ANSI/NFPA 70, multi-conductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
- D. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.
- E. Division 26 Contractor shall be responsible for providing matching cord/receptacle for all equipment not furnished with such equipment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify conditions under provisions of Section 01 30 00 "Administrative Requirements."
- B. Verify that equipment is ready for electrical connection, wiring, and energization.

3.2 ELECTRICAL CONNECTIONS

- A. Make electrical connections in accordance with equipment manufacturer's instructions.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
- C. Make wiring connections using wire and cable with insulation suitable for temperatures encountered in heat producing equipment.
- D. Provide receptacle outlet where connection with attachment plug is indicated. Provide cord and cap where field-supplied attachment plug is indicated.
- E. Provide suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- F. Install disconnect switches, controllers, control stations, and control devices as indicated.
- G. Modify equipment control wiring with terminal block jumpers as indicated.
- H. Provide interconnecting conduit and wiring between devices and equipment where indicated.
- I. Check and modify phase connections as required for proper motor rotation.
- J. Provide power to equipment only after equipment supplier verifies acceptance to receive and approves.
- K. Contractor shall coordinate with all equipment to verify exact power and control wiring as required to properly serve equipment.
- L. The Division 26 Contractor shall be responsible for specific equipment requirements associated with provisions to provide for power, control and support associated with various pieces of specialized medical equipment, headwalls, lighting, etc. where exact rough-in information is not shown. Coordinate with the actual equipment to be installed to determine the exact requirements. All such requirements for wiring, conduit grounding and pathways shall be included in this Project.

END OF SECTION

SECTION 26 05 26 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Grounding electrodes and conductors.
 - 2. Equipment grounding conductors.
 - 3. Bonding.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. Section 01 40 00 "Quality Requirements": References and standards.
- B. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association).
- C. NFPA 70 - National Electrical Code.
- D. TDSHS - Requirements of the Texas Department of State Health Services.

1.3 GROUNDING SYSTEM DESCRIPTION

- A. Metal frame of the building.
- B. Rod electrodes.

1.4 PERFORMANCE REQUIREMENTS

- A. Grounding System Maximum Resistance: 10 ohms.

1.5 SUBMITTALS FOR REVIEW

- A. Section 01 70 00 "Execution and Closeout Requirements": Procedures for submittals.
- B. Product Data: Provide for grounding electrodes and connections.

1.6 SUBMITTALS FOR CLOSEOUT

- A. Section 01 70 00 "Execution and Closeout Requirements": Procedures for submittals.
- B. Project Record Documents: Record actual locations of components and grounding electrodes.
- C. Certificate of Compliance: Indicate approval of installation by authority having jurisdiction.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section, minimum 3 years' documented experience, and with service facilities within 100 miles of Project.

1.8 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.1 MECHANICAL CONNECTORS

- A. Material: Bronze.

2.2 EXOTHERMIC CONNECTIONS

- A. Manufacturer: Cadweld.

2.3 WIRE

- A. Material: Stranded copper.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 "Administrative Requirements": Verification of existing conditions prior to beginning Work.

3.2 INSTALLATION

- A. Section 01 40 00 "Quality Requirements": Manufacturer's instructions.
- B. Grounding dry type transformers: Ground the transformers to the effectively grounded building steel system in accordance with NEC.
- C. Provide bonding to meet Regulatory Requirements.
- D. Equipment Grounding Conductor: Provide separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- E. Grounding Electrode System: The new grounding electrode system shall consist of the common bonding of building steel, and connection from new equipment to the building's existing grounding system.
- F. Provide proper bonding of the electrical system's grounded conductor (neutral) and the grounding electrode system sized in accordance with N.E.C. Article 250.
- G. Provide grounding type bushings at all panelboards on the panel feeder.
- H. Panelboard Bonding: All panelboards derived from the normal and essential electrical system shall be bonded together with a No. 8 AWG, insulated, continuous conductor.
- I. At each dry-type transformer, provide a neutral-ground bond and extend the grounding electrode conductor to the grounding electrode system. At a minimum this shall include both a driven ground rod and a connection to the building's steel structure.
- J. Provide a separate insulated grounding conductor for all light fixture flexible whips.

3.3 FIELD QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements": Field inspection, testing, adjusting.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.13.

- D. In addition, the Contractor shall perform impedance and resistance testing for compliance with NFPA 99, Health Care Facilities. This standard outlines the requirements of such testing. All data shall be tabulated in type-written forms and presented to the Engineer for review prior to the Substantial Completion.

END OF SECTION

SECTION 26 05 29 - SUPPORTING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Conduit and equipment supports.
 - 2. Anchors and fasteners.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. NECA - National Electrical Contractors Association.
- B. ANSI/NFPA 70 - National Electrical Code.

1.3 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PART 2 - PRODUCTS

2.1 PRODUCT REQUIREMENTS

- A. Materials and Finishes: Provide adequate corrosion resistance.
- B. Provide materials, sizes, and types of anchors, fasteners, and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.
- C. Anchors and Fasteners:
 - 1. Concrete Structural Elements: Use expansion anchors, powder actuated anchors and preset inserts.
 - 2. Steel Structural Elements: Use beam clamps, spring steel clips and steel ramset fasteners.
 - 3. Concrete Surfaces: Use self-drilling anchors and expansion anchors.
 - 4. Sheet Metal: Use sheet metal screws.
 - 5. Wood Elements: Use wood screws.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Provide anchors, fasteners, and supports in accordance with NECA - Standard of Installation.
- C. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- D. Obtain permission from Engineer before drilling or cutting structural members.
- E. Fabricate supports from structural steel as indicated on Drawings. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use lock washers under all nuts.

- F. Install surface-mounted cabinets and panelboards with minimum of 4 anchors.
- G. In wet and damp locations use steel channel supports to stand cabinets and panelboards 1 inch off wall.
- H. Install conduit supports a maximum spacing specified in the NEC.
- I. Contractor shall be responsible for providing steel channel anchored supports for all disconnects serving equipment. Provide galvanized channel and submit detail prior to fabrication.
- J. Refer to the Drawings for locations that may require steel framing supports for stacking of dry-type transformers. Any such configurations shall be included in the submittal review.

END OF SECTION

SECTION 26 05 33 - CONDUIT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal conduit.
 - 2. Flexible metal conduit.
 - 3. Liquidtight flexible metal conduit.
 - 4. Electrical metallic tubing.
 - 5. Fittings and conduit bodies.
- B. Related Sections:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 26 05 26 "Grounding and Bonding."
 - 3. Section 26 05 29 "Supporting Devices."
 - 4. Section 26 05 33.16 "Boxes."
 - 5. Section 26 05 53 "Electrical Identification."

1.2 REFERENCES

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
- C. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- D. ANSI/NFPA 70 - National Electrical Code.
- E. NECA - Standard of Installation.

1.3 DESIGN REQUIREMENTS

- A. Conduit Size: ANSI/NFPA 70.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 70 00 "Execution and Closeout Requirements."
- B. Product Data: Provide for metallic conduit, flexible metal conduit, liquidtight flexible metal conduit, nonmetallic conduit, fittings, and conduit bodies.

1.5 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 01 70 00 "Execution and Closeout Requirements."
- B. Accurately record actual routing of conduits.

1.6 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00 "Product Requirements."
- B. Accept conduit on site. Inspect for damage.
- C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

1.8 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Verify routing and termination locations of conduit prior to rough-in.
- C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

PART 2 - PRODUCTS

2.1 CONDUIT REQUIREMENTS

- A. Minimum Size: 3/4-inch unless otherwise specified.
- B. Wet and Damp Locations above grade: Use rigid steel or liquid tight flexible conduit.
- C. Dry Locations: Use electrical metallic tubing for concealed and exposed locations.
- D. MC Cable: Shall not be utilized on this Project.
- E. Light fixture whips shall be U.L. listed for grounding or shall have a separate equipment grounding conductor.

2.2 METAL CONDUIT

- A. Manufacturers:
 - 1. Allied
 - 2. Wheatland
 - 3. Substitutions: Under provisions of Section 01 60 00 "Product Requirements."
- B. Rigid Steel Conduit: ANSI C80.1.
- C. Intermediate Metal Conduit (IMC): Rigid steel.
- D. Fittings and Conduit Bodies: ANSI/NEMA FB 1; all steel fittings.

2.3 FLEXIBLE METAL CONDUIT

- A. Manufacturers:
 - 1. Allied Tube.
 - 2. Electri-Flex.
 - 3. Greenfield.
 - 4. Substitutions: Under provisions of Section 01 60 00 "Product Requirements."
- B. Description: Interlocked steel construction. Aluminum is not permitted.
- C. Fittings: ANSI/NEMA FB 1 with fittings approved for steel flex.
- D. Applications: Use for final connections to motorized equipment, connections to recessed lighting fixtures located in accessible ceilings, and connections to dry type transformers. Utilization of 3/8-inch in lieu of the minimum 3/4-inch is acceptable under the limitations of the National Electrical Code.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Manufacturers:
 - 1. Electri-flex.
 - 2. Ultatite.
 - 3. Substitutions: Under provisions of Section 01 60 00 "Product Requirements."
- B. Description: Interlocked steel construction with PVC jacket.
- C. Fittings: ANSI/NEMA FB 1.
- D. Applications: Use for final connections to motorized equipment in exterior locations and areas subjected to moisture.

2.5 ELECTRICAL METALLIC TUBING (EMT)

- A. Manufacturers:
 - 1. Allied.
 - 2. Substitutions: Under provisions of Section 01 60 00 "Product Requirements."
- B. Description: ANSI C80.3; galvanized tubing.
- C. Fittings and Conduit Bodies: ANSI/NEMA FB 1; all steel, compression or set screw type.
- D. Applications: Do not use below grade or in exterior locations. Use only in interior locations.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install conduit in accordance with NECA - Standard of Installation.
- B. Install nonmetallic conduit in accordance with manufacturer's instructions.
- C. Arrange supports to prevent misalignment during wiring installation.
- D. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- E. Group related conduits; support using conduit rack. Construct rack using steel channel.
- F. Fasten conduit supports to building structure and surfaces under provisions of Section 26 05 29 "Supporting Devices."
- G. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
- H. Do not attach conduit to ceiling support wires.
- I. Arrange conduit to maintain headroom and present neat appearance.
- J. Route exposed conduit parallel and perpendicular to walls.
- K. Route conduit installed above accessible ceilings parallel and perpendicular to walls.
- L. Maintain adequate clearance between conduit and piping.
- M. Maintain 12-inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F.
- N. Cut conduit square using saw or pipecutter; de-burr cut ends.
- O. Bring conduit to shoulder of fittings; fasten securely.
- P. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- Q. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2-inch size.

- R. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
- S. Provide suitable fittings to accommodate expansion and deflection where conduit crosses, control and expansion joints.
- T. Provide suitable pull string in each empty conduit except sleeves and nipples.
- U. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
- V. Ground and bond conduit under provisions of Section 26 05 26 "Grounding and Bonding."
- W. Identify conduit under provisions of Section 26 05 53 "Electrical Identification."
- X. Ducts shall be cleaned with a flexible mandrel assembly.
- Y. Roof penetrations for conduits shall adhere to the requirements and details as indicated on the Architectural Drawings.
- Z. Where conduits are shown roof-mounted, provide a conduit support system for the entire run. Utilize MAPCO or approved equal supports. Spacing shall be as recommended by the manufacturer. Ratings of the supports shall be at least 150 percent of the actual installed load.
- AA. Where conduits cross building expansion joints, provide flexible type connections to facilitate crossing.

3.2 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods under the provisions listed.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.

END OF SECTION

SECTION 26 05 33.16 - BOXES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wall and ceiling outlet boxes.
 - 2. Pull and junction boxes.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 26 27 26 "Wiring Devices": Wall plates in finished areas.

1.2 REFERENCES

- A. NECA - Standard of Installation.
- B. NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.
- C. NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- D. NEMA 250 - Enclosures for Electrical Equipment (1,000 Volts Maximum).
- E. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS FOR CLOSEOUT

- A. Section 01 70 00 "Execution and Closeout Requirements": Submittals for Project closeout.
- B. Record actual locations and mounting heights of outlet, pull, and junction boxes on Project record documents.

1.4 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Provide products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

1.5 GENERAL

- A. Boxes in the conduit system are not shown on the Drawings. The Contractor shall be responsible for installing pull and junction boxes where required to limit the number of bends or as necessary to limit cable pulling tensions.

PART 2 - PRODUCTS

2.1 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
- B. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include half-inch male fixture studs where required.
- C. Cast Boxes: NEMA FB 1, Type FD, cast ferrous alloy. Provide gasketed cover by box manufacturer.
- D. Wall Plates for Finished Areas: As specified in Section 26 27 26 "Wiring Devices."

2.2 PULL AND JUNCTION BOXES

- A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
- B. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box.
- C. Material: Galvanized cast iron.
- D. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify locations of outlets in all areas prior to rough-in.

3.2 INSTALLATION

- A. Install boxes in accordance with NECA - Standard of Installation.
- B. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements.
- C. Set wall mounted boxes at elevations to accommodate mounting heights specified in Section for outlet device.
- D. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Adjust box location up to 10 feet if required to accommodate intended purpose.
- E. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26 "Wiring Devices."
- F. Maintain headroom and present neat mechanical appearance.
- G. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- H. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- I. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified.
- J. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes with Architectural Drawings and other trades.
- K. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.
- L. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.
- M. Use flush mounting outlet box in finished areas.
- N. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- O. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches separation. Provide minimum 24 inches separation in acoustic rated walls.
- P. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- Q. Use stamped steel bridges to fasten flush mounting outlet box between studs.
- R. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- S. Use adjustable steel channel fasteners for hung ceiling outlet box.
- T. Do not fasten boxes to ceiling support wires.
- U. Support boxes independently of conduit.
- V. Use gang box where more than one device is mounted together. Do not use sectional box.
- W. Use gang box with plaster ring for single device outlets.
- X. Use cast outlet box in exterior locations exposed to the weather and wet locations.

- Y. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.
- Z. Coordinate with other trades for box rough-in, such that control devices are grouped (i.e., thermostats, wall switches, volume controls, etc.).
- AA. Refer to Specification Section 26 05 53 "Electrical Identification" for junction box cover labeling.
- BB. Provide adjustment and leveling for the flush floor mounted boxes.
- CC. Boxes for use with duplex outlets shall utilize a separate box per outlet. Do not mount multiple outlets in a multi-gang box.

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate installation of outlet box for equipment connected under Section 26 05 19 "Equipment Wiring Systems."

3.4 ADJUSTING

- A. Section 01 70 00 "Execution and Closeout Requirements": Adjusting installed Work.
- B. Adjust flush-mounting outlets to make front flush with finished wall material.
- C. Install knockout closures in unused box openings.

3.5 CLEANING

- A. Section 01 70 00 "Execution and Closeout Requirements": Cleaning installed Work.
- B. Clean interior of boxes to remove dust, debris, and other material.
- C. Clean exposed surfaces and restore finish.

3.6 REPAIR

- A. Repair any areas or surfaces damaged during conduit installation.
- B. Paint (resurface) to original condition.

END OF SECTION

SECTION 26 05 53 - ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Nameplates and labels.
 - 2. Wire and cable markers.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.

PART 2 - PRODUCTS

2.1 NAMEPLATES AND LABELS

- A. Nameplates and Labels: Engraved 3-layer laminated plastic, white letters on black background for normal branch and white letters on red background for emergency branch.
- B. Locations:
 - 1. Each electrical distribution and control equipment enclosure.
 - 2. Communication cabinets, and computer cabinets.
 - 3. Field disconnects, start stop stations, control panels.
- C. Letter Size:
 - 1. Use 1/4-inch letters for identifying individual equipment and loads.
 - 2. Use 1/4-inch letters for identifying grouped equipment and loads.
 - 3. Use 3/8-inch letters for identifying Main Disconnect equipment.

2.2 WIRE/CONDUIT/BOX MARKERS

- A. Description: Brady B-321 Heat-Shrink Polyolefin markers. Typed label to identify each termination end point of the conductor. DC conductors shall identify polarity. Locations: Each conductor at wireway, pull boxes, outlet and junction boxes, and each load connection. All conduit penetrations identifying the location of each end.
- B. Legend:
 - 1. Power and Lighting Circuits: Branch circuit or feeder number indicated on Drawings.
- C. Boxes:
 - 1. Label each junction box in accessible locations to indicate system type (i.e., security; power circuit - 1, 3, 5; etc. to include the type of power; lite-safety, critical, etc.).
 - 2. Boxes serving fire alarm system shall have box covers painted red.

2.3 RECEPTACLE MARKERS

- A. All receptacle plates shall be clearly marked to indicate the panel and circuit number of the branch breaker that serves the receptacle. The marking shall be the permanently engraved type. Installing engraved laminated plastic labels on or above the receptacle cover will not be acceptable. The circuit tag shall be engraved into the receptacle cover.
- B. Provide a sample for engraved receptacle wall plates for review prior to installation.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive nameplates and labels.

3.2 APPLICATION

- A. Install nameplate and label parallel to equipment lines.
- B. Secure nameplate to equipment front using screws or rivets.
- C. Identify all conductors at every termination indicating endpoints of termination and tag identification as required.
- D. Color coding for phase identification:

120/208 volts	Phase	277/480 Volts
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray
Green	Ground	Green

- E. Conductor phase and voltage identification shall be made by color-coded insulation for all conductors smaller than No. 6 AWG. For conductors No. 6 AWG and larger, identification shall be made by color-coded insulation, or conductors with black insulation may be furnished and identified by colored electrical tape. Conductor identification shall be provided within each enclosure where a tap, splice, or termination is made.

END OF SECTION

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wall switches.
 - 2. Dimmers.
 - 3. Receptacles.
 - 4. Device plates and decorative box covers.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 26 05 33.16 "Boxes."

1.2 REFERENCES

- A. NECA - Standard of Installation.
- B. NEMA WD 1 - General Requirements for Wiring Devices.
- C. NEMA WD 6 - Wiring Device -- Dimensional Requirements.
- D. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS FOR REVIEW

- A. Section 01 30 00 "Submittal Procedures": For submittals.
- B. Product Data: Provide manufacturer catalog information showing dimensions, colors, and configurations.
- C. Manufacturers with similar catalog numbers not considered as a basis for an equivalent product.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum 3 years documented experience.

1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Provide Products listed and classified by U.L. as suitable for purpose specified and indicated.

PART 2 - PRODUCTS

2.1 WALL SWITCHES

- A. Manufacturers:
 - 1. Hubbell HBL1221-I.
 - 2. Substitutions: Refer to Section 01 60 00 "Product Requirements."
- B. Description: NEMA WD 1, 20 amp, Heavy-Duty, AC only general-use snap switch.

- C. Body and Handle: nylon ivory handle for branch circuits on normal and red plastic for the essential emergency system.
- D. Utilize equivalent series of manufacturer numbers above for 3-way, 4-way, and 2-pole applications.

2.2 DIMMERS

- A. Manufacturers:
 - 1. Lutron Nova.
 - 2. Or approved equal.
- B. Description: 1500 watt, 277V, 60 HZ, slide control.
- C. Device Body: Provide decorative, ivory plate kit, or normal and a red plate kit for emergency.
- D. All LED dimmers shall be compatible with LED dimming drivers; Lutron Hi-Lum or approved equal.

2.3 RECEPTACLES

- A. Manufacturers:
 - 1. Hubbell HBL 8300R or HBL 8300I.
 - 2. Substitutions: Refer to Section 01 60 00 "Product Requirements." Equivalent.
- B. Description: NEMA WD 1, Heavy-duty hospital grade receptacle, with triple wipe contacts and grounding contacts integral with backstrap (no rivets).
- C. Device Body: Ivory plastic for branch circuits on normal power and red plastic for receptacles on the essential emergency system.
- D. Configuration: NEMA WD 6, type as specified and indicated.
- E. Convenience Receptacle: Type 5-20.
- F. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements. Hubbell GF8300-I or equivalent.
- G. USB Charger Receptacle – Hospital Grade
 - 1. HBL 8300USBI or 8300 USBR.
 - 2. Or approved equal.
 - a. Provide duplex receptacle with integral USB charger for locations that indicate "USB" located adjacent to duplex receptacle on Drawings.
 - b. Provide ivory finish for normal circuits and red finish for emergency circuits.

2.4 WALL PLATES

- A. Decorative Cover Plate: Stainless steel.
- B. Weatherproof Cover Plate: Gasketed cast metal with gasketed device cover on exterior devices.
- C. Surface Mounted Plates: Galvanized steel plates.
- D. Refer to Specification Section 26 05 53 "Electrical Identification," for requirements of labeling receptacle plates.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 "Administrative Requirements": Verification of existing conditions prior to beginning Work.
- B. Verify that outlet boxes are installed at proper height.

- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- E. Verify installation location of all boxes to be installed in millwork with Architect.

3.2 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean debris from outlet boxes.

3.3 INSTALLATION

- A. Install in accordance with NECA - Standard of Installation.
- B. Install devices plumb and level.
- C. Install switches with OFF position down.
- D. Install receptacles with grounding pole on top.
- E. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.
- F. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
- G. Connect wiring devices by wrapping conductor around screw terminal.
- H. Use jumbo size plates for outlets installed in masonry walls.
- I. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
- J. Install blank cover plate to match other wall plates on all unused boxes.
- K. Coordinate with exact equipment locations prior to rough-in.
- L. Verify exact floor elevations for installation of recessed floor boxes.
- M. Multi-ganged receptacle installations are not permitted. At locations where more than one receptacle is shown, provide an independent box for each receptacle.

3.4 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes provided under Section 26 05 33.16 "Boxes" to obtain mounting heights specified and indicated on drawings.
- B. Install all wall switches, thermostats, fire alarm pull stations, and all control operators at 42 inches above finished floor.
- C. Install convenience receptacle 18 inches above finished floor unless otherwise shown on Plans.
- D. Install convenience receptacle 6 inches above backsplash of counter unless otherwise directed by Architect.
- E. Install telephone jack 18 inches above finished floor.
- F. Install telephone jack for side-reach wall telephone to position top of telephone at 52 inches above finished floor.
- G. Install telephone jack for forward-reach wall telephone to position top of telephone at 42 inches above finished floor.

3.5 FIELD QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements": Field inspection, testing, adjusting, and balancing.
- B. Inspect each wiring device for defects.
- C. Operate each wall switch with circuit energized and verify proper operation.
- D. Verify that each receptacle device is energized.
- E. Test each receptacle device for proper polarity.
- F. Test each GFCI receptacle device for proper operation.

3.6 ADJUSTING

- A. Section 01 73 00 "Execution" and Section 01 77 00 "Closeout Procedures": Adjusting installed Work.
- B. Adjust devices and wall plates to be flush and level.

3.7 CLEANING

- A. Section 01 73 00 "Execution" and Section 01 77 00 "Closeout Procedures": Cleaning installed Work.
- B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 26 28 16.16 - ENCLOSED SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fusible switches.
 - 2. Non-fusible switches.
 - 3. Fuses.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. NEMA KS 1 - Enclosed Switches.
- B. NFPA 70 - National Electrical Code.
- C. UL 198C - High-Interrupting Capacity Fuses; Current Limiting Type.
- D. UL 198E - Class R Fuses.
- E. NEMA AB 1 - Molded Case Circuit Breakers.
- F. NECA - Standard of Installation.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 "Submittal Procedures."
- B. Product Data: Provide switch ratings and enclosure dimensions.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with NECA Standard of Installation.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 3 years' documented experience.

1.6 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Furnish products listed and classified by UL as suitable for purpose specified and shown.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Eaton.
- B. General Electric.
- C. Square D.

2.2 ENCLOSED SWITCHES

- A. Fusible or Non-fusible as indicated.
- B. Switch Assemblies: NEMA KS 1, Type HD (heavy duty) load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.
- C. Fuse Clips: Designed to accommodate NEMA FU1, class R fuses.
- D. Enclosures: NEMA KS 1.
- E. Interior Dry Locations: Type 1.
- F. Exterior Locations: Type 3R or 4.
- G. NEMA ratings of enclosures if specified on Drawings take precedence over the minimum ratings specified herein.
- H. Current rating of switch to be equal to or greater than that of the circuit it is interrupting.

2.3 FUSES

- A. Manufacturers:
 - 1. Bussman.
 - 2. Gould Shawmut.
 - 3. Littlefuse.
- B. Dimensions and Performance: NEMA FU 1, Class as specified or indicated.
- C. Voltage: Provide fuses with suitable voltage ratings for phase to phase voltages.
- D. Service Entrance: Class L, Bussman Low-peak or equivalent.
- E. General Purpose Loads: Class RK1, Bussman Low-peak or equivalent.
- F. Motor Loads: Class RK5, Bussman Fusetron or equivalent.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with NECA Standard of Installation.
- B. Install fuses in all fusible disconnects.
- C. Apply adhesive tag on the inside door of all disconnects indicating the NEMA class fuse and size installed. Refer to Section 26 05 53 "Electrical Identification," for additional labeling.
- D. Provide a disconnect switch for all equipment where indicated or required by the National Electrical Code. Coordinate with other disciplines to determine where disconnects are furnished with equipment.

END OF SECTION

SECTION 26 51 00 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior luminaires and accessories.
 - 2. Exit signs.
 - 3. LED fixtures.
 - 4. Emergency power supply.
 - 5. Occupancy sensors.
 - 6. LED Drivers/Lamps.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. ANSI C82.1 - Ballasts for Fluorescent Lamps - Specifications.
- B. NEMA WD 6 - Wiring Devices-Dimensional Requirements.
- C. NFPA 70 - National Electrical Code.
- D. NFPA 101 - Life Safety Code.

1.3 SUBMITTALS FOR REVIEW

- A. Section 01 33 00 "Submittal Procedures": Procedures for submittals.
- B. Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
- C. Product Data: Provide dimensions, ratings, and performance data.

1.4 SUBSTITUTIONS

- A. Refer to Section 26 05 00 "Basic Electrical Methods" for requirements.

1.5 SUBMITTALS FOR CLOSEOUT

- A. Section 01 73 00 "Execution" and Section "Closeout Procedures": Submittals for Project closeout.
- B. Submit manufacturer's operation and maintenance instructions for each product.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum 3 years' documented experience.

1.7 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Conform to requirements of NFPA 101.
- C. Products: Listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

1.8 EXTRA PRODUCTS

- A. Section 01 73 00 "Execution" and Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 LUMINAIRES

- A. Furnish Products as scheduled. Refer to Section 01 60 00 "Product Requirements" for substitutions and product options.

2.2 EXIT SIGNS

- A. Furnish products as scheduled.

2.3 LED FIXTURES

- A. Manufacturers:
 - 1. Acuity Brands and Line Card.
 - 2. Cooper and Line Card.
 - 3. H. E. Williams and Line Card.
 - 4. Section 01 60 00 "Product Requirements": Substitutions: Permitted.
- B. Refer to Lighting Fixture Schedule on Drawings for all LED fixture requirements.

2.4 EMERGENCY POWER SUPPLY

- A. Description: Emergency battery supply suitable for installation in driver compartment of luminaire.
- B. Lamp Rating: Providing 1,100 lumens minimum.
- C. Battery: Sealed lead calcium type, rated 10-year life.
- D. Include "Test" switch and "AC on" indicator light, installed to be operable and visible from the outside of an assembled luminaire.

2.5 OCCUPANCY SENSORS

- A. Sensors:
 - 1. Provide dual technology passive infrared/ultrasonic sensors where indicated on the Drawings.
 - 2. All units shall be U.L. listed.
 - 3. Provide adjustable sensitivity and digital time delay.
 - 4. Provide with swivel mounted bracket for use in ceiling mounted applications.
 - 5. Provide LED indication for occupancy detection of each of the two technologies.
 - 6. Sensors shall be capable of covering an area of approximately 1,000 square feet while detecting typical desktop motions.

7. Sensors shall be equal to watt stopper DT-205 or approved equal.
 8. Single wall switch occupancy sensor shall be watt stopper WI-200 or approved equal.
 9. Dual wall switch occupancy sensor shall be watt stopper WI-300 or approved equal.
- B. Accessories:
1. Provide power packs and slave packs as required to power the sensors and provide interlocking and control strategies as indicated.

2.6 LED DRIVERS/LAMPS

- A. General:
1. Standard product as provided by the manufacturer with applicable certifications and listings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Locate recessed ceiling luminaires as indicated on reflected ceiling plan.
- B. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prevent movement.
- C. Exposed Grid Ceilings: Support surface mounted luminaires on grid ceiling directly from building structure.
- D. Install recessed luminaires to permit removal from below.
- E. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating in locations where fire rated ceilings are present.
- F. Install clips to secure recessed grid-supported luminaires in place.
- G. Install accessories furnished with each luminaire.
- H. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
- I. Bond products and metal accessories to branch circuit equipment grounding conductor.
- J. Install specified lamps in each emergency lighting unit, exit sign, and luminaire.
- K. Contractor shall be responsible for providing branch circuits, grounding, and providing rough-in conduits for wall controllers for exam lights where indicated.
- L. Provide a minimum of 100 hours of burn-in time at full intensity for lamps to be used on dimming systems or burn-in as recommended by ballast manufacturer.

3.2 FIELD QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements": Field inspection, testing, and adjusting.
- B. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.3 ADJUSTING

- A. Section 01 73 00 "Execution" and Section "Closeout Procedures": Adjusting installed Work.
- B. Aim and adjust luminaires as directed.
- C. Position exit sign directional arrows as indicated.

3.4 CLEANING

- A. Section 01 73 00 "Execution" and Section "Closeout Procedures": Cleaning installed Work.
- B. Clean electrical parts to remove conductive and excess materials.
- C. Remove dirt and debris from enclosures.
- D. Clean photometric control surfaces as recommended by manufacturer.
- E. Clean finishes and touch up damage.

3.5 DEMONSTRATION AND INSTRUCTIONS

- A. Section 01 73 00 "Execution" and Section "Closeout Procedures": Demonstrating installed Work.

3.6 PROTECTION OF FINISHED WORK

- A. Section 01 73 00 "Execution" and Section "Closeout Procedures": Protecting installed Work.
- B. Re-lamp luminaires that have failed lamps at Substantial Completion.

END OF SECTION