

PLAN HOLDER REGISTRATION FORM / TERMS & CONDITIONS

Invitation for Bids (IFB) No. 15PJDP-24-GG-00803-BRND

Starr County Juvenile Detention Center Upgrades

It is the responsibility of all persons who download bid documents to REGISTER as a Plan Holder with Starr County, Texas. Registered Plan Holders will be advised via email or other means of all IFB Amendments that are issued, and all Amendments will be available for downloading at the Starr County website: **www.co.starr.tx.us**, Link: Invitation for Bids 15PJDP-24-GG-00803-BRND, Starr County Juvenile Detention Center Upgrades. A bidder's failure to acknowledge receipt of an IFB Amendment (see IFB PART I, Subpart B, Instructions to Bidders) may result in rejection of the sealed bid.

TO REGISTER, please fill out information below (all fields are mandatory) and submit form via:

FAX to 956-716-8181 (Attention: Maricella Ibarra, Alternate Contracting Officer)

-- or --

Scan and EMAIL completed form to **both** of the following email addresses:

mibarra@co.starr.tx.us

jamaynard1@msn.com

SIGNATURE (Contact Person listed below): _____

Company Name: _____

Contact Person/Title: _____

Mailing Address: _____

Physical Address: _____

Office Phone: _____ Mobile: _____ FAX: _____

Email Address: _____

Bid documents for this project may be downloaded from this site, for bidding purposes only, if the User agrees, without exception, to the following terms and conditions:

The User agrees that electronic media documents downloaded from this site are for their use in preparation of their bid and are offered as a convenience to the User. Use of these materials for any other purpose shall be without liability to Starr County, Texas and their consultants. The User acknowledges and agrees that Starr County's instruments of service are the printed hard copy (as amended) of the Invitation for Bids issued for the respective project as available for viewing at the Starr County, Texas, Annex (Suite 220). In the event of a conflict in their contents, the printed hard copy shall take precedence over the electronic media. Starr County's electronic media are furnished without guarantee of compatibility with the bidder's software or hardware. It is the User's responsibility to determine/evaluate the capability of their equipment to provide documents that are accurate for size, scale, and content.

If the User elects to only download partial information (selected sheets of the drawings or pages of the specifications), they shall be responsible for obtaining all pertinent bidding information to adequately and accurately prepare their bid proposal. The User is responsible for including in their proposal all of the Required Bid Information as specified in IFB Division 00, Section 00 21 16, Instructions to Proposers.

The User agrees to indemnify, defend and hold harmless Starr County, Texas, their consultants and the officers and employees and any of them from and against any and all claims, suits, losses, damages or costs, including attorney's fees, arising from or by reason of the User's use of these electronic media documents.



INVITATION FOR BIDS (IFB)
No. 15PJDP-24-GG-00803-BRND
February 5, 2025

Starr County Juvenile Detention Center
Upgrades

Starr County, Texas

Contracting Local Organization

Starr County Commissioners' Court
Rio Grande City, Texas

In cooperation with:

**U.S. Department of Justice, Office of Justice Programs, and the Office of Juvenile
Justice and Delinquency**



SPECIFICATIONS

STARR COUNTY

IFB NO. 15PJDP-24-
GG-00803-BRND

Juvenile Detention Center
Upgrades

Milnet Architectural Services, PLLC

608 S. 12th Street
McAllen, Texas 78501

Phone: 956-688-5656
Fax: 956-687-9289

Website: www.milnet-archservices.com

Project No. 224028

Set No:

STARR COUNTY
IFB NO. 15PJDP-24-GG-00803-BRND
JUVENILE DETENTION CENTER UPGRADES

PROJECT MANUAL

MAS Project No. 224028 Plans and Specifications

**Starr County Juvenile Detention Center Upgrades
Rio Grande City, Texas 78582**



02/05/2025

TEXAS BOARD OF ARCHITECTURAL EXAMINERS
333 Guadalupe, Suite 2-350, AUSTIN, TX 78701-3942
(Tel: 512/305-9000)
HAS JURISDICTION OVER INDIVIDUALS LICENSED UNDER
THE ARCHITECT'S REGISTRATION LAW
ARTICLE 249a, VERNON'S CIVIL STATUTES".

MILNET ARCHITECTURAL SERVICES, PLLC
608 S. 12th St.
McALLEN, TEXAS 78501
(956) 688-5656 - FAX (956) 687-9289

The County of Starr
Starr County Juvenile Detention Center Upgrades
401 Britton Ave. Rio Grande City, Texas 78582
MAS Project No. 224028

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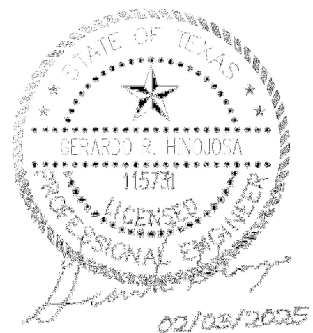
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SECTION 00 11 00 — ADVERTISEMENT AND INVITATION

PART 1 - GENERAL

1.1 PROJECT DESCRIPTION:

The scope of work includes but is not limited to security systems upgrades (cell door hardware/reinforcement/replacement, intercoms, surveillance, access control), plumbing upgrades, lighting upgrades, light demo/remodel, and minor exterior upgrades.

- A. Refer to Section 00 21 16 – Instructions to Proposers.

1.2 PRE-PROPOSAL CONFERENCE:

- A. The purpose of the Pre-Proposal Conference is to answer any questions that any bidder may have. This is the last date for questions. All questions must be asked in a written format only and directed to Rudy Molina, AIA, Milnet Architectural Services, 608 S. 12th St., McAllen, Texas 78501/ (956) 688-5656 Phone – (956) 687-9289 Fax, rudym@milnet-archservices.com. All questions will be answered in a written addendum only.
- B. Date and Time: Wednesday, February 19, 2025 @ 10:00 A.M.
- C. Location: Starr County Annex Conference Room A
100 N. FM 3167, Suite 220, Rio Grande City, TX 78582

1.3 OPENING OF PROPOSALS:

- A. Place:
1. Competitive sealed proposals will be received at the office of :

Owner: The County of Starr
Address: 100 N. FM 3167, Suite 202, Rio Grande City, TX. 78582 (County Judge's Office)
Attention: Maricela G. Ibarra
Director for Starr County Federal and State Programs
- B. Date: **Wednesday, February 26, 2025**
- C. Hour: **3:00 P.M.**

1.4 REJECTION:

- A. The Owner reserves the right to reject any or all Proposals, and to waive any irregularities or formalities.

END OF SECTION

SECTION 00 11 19 - REQUEST FOR COMPETITIVE SEALED PROPOSALS

PROJECT: Starr County Juvenile Detention Center Upgrades

OWNER: The County of Starr
401 Britton Ave.
Rio Grande City, Texas 78582
(956) 716-4800

ARCHITECT: Milnet Architectural Services
608 South 12th Street
McAllen, Texas 78501

RFCSB DEADLINE: **Wednesday, February 26, 2025 @ 3:00 p.m.**

INVITATION: Your firm is invited to submit Competitive Sealed Proposals to the Owner, at the Owner's address indicated above, for the work described above, on or before the RFCSP deadline indicated above.

PRE-PROPOSAL CONFERENCE: A pre-bid conference will be held at 10:00 a.m. local time on Wednesday, February 19, 2025, at Suite 211, Starr County Annex Conference Room. A site showing of the project site will follow the conference. The deadline for question submissions is Thursday, February 20, 2025. All contractors proposing to submit competitive sealed proposals on this project are strongly encouraged to attend.

INSPECTION OF SITE: The site is also accessible for inspection at other times upon notification to Maricela G. Ibarra, Director for Starr County Federal and State Programs, at (956) 716-4800. Proposers are encouraged to visit the site and assess existing conditions.

PROPOSAL DOCUMENTS: Invitation for Bids (IFB) documents will be available electronically beginning Wednesday, February 5th, 2025. Complete IFB documents and a Plan Holders Registration Form/Terms & Conditions may be viewed and downloaded at no charge from the Starr County website: www.co.starr.tx.us – click on Invitation for Bids “Starr County Juvenile Detention Center Upgrades”. Contact Abel Barrera (956-716-4800) if you have problems downloading documents. Electronic copies of the Bid/Contract Documents may also be obtained by emailing a request to rudym@milnet-archservices.com. No printed copies of the IFB will be distributed to interested parties, but a printed copy is available for viewing at the Starr County Annex, 100 N. FM 3167, Suite 220, Rio Grande City, TX 78582.

PROPOSAL SECURITY: Proposers will be required to provide Proposal Security in the form of a Proposal Bond in the amount of 5 percent of the largest possible total proposal, including consideration of alternates, with each proposal. A Proposal Bond shall be issued by a Surety acceptable to the Owner and meeting the requirements of General Conditions of the Contract for Construction. Proposal Bonds shall be prepared on forms meeting all the requirements of applicable States of Texas statutes. Proposal Bonds shall be issued on forms acceptable to the Owner and shall include, as a minimum standard, the information, requirements and standard illustrated by AIA Document A310, latest revised edition available. Failure to provide the Proposal Bond with the proposal will constitute a non-responsive proposal and the proposal will not be considered.

PERFORMANCE AND LABOR AND MATERIAL PAYMENT BONDS: The successful offeror will be required to provide 100% Performance and Labor and Materials Payment Bonds in strict conformance with all the requirements of the Contract Documents. Failure to do so will result in cancellation of the contract award and forfeiture of the Proposal Bond security as liquidated damages.

PROPOSAL WITHDRAWAL: Proposals will be required to be submitted under a condition of irrevocability for a period of 60 days after submission. No proposal may be withdrawn for a period of 60 days.

OWNER'S RIGHT OF REJECTION: The Owner reserves the right to accept or reject any or all offers (competitive sealed proposals).

SECTION 00 21 16 — INSTRUCTIONS TO PROPOSERS

PART 1 - GENERAL

1.1 SECURITY BOND:

- A. Security bond in the amount of five (5%) of the Proposal must accompany each Proposal. Security bond shall be issued by an insurance company authorized to provide bonds on work in the State of Texas and shall be payable to the Owner.

1.2 DOCUMENTS:

- A. Complete sets of Construction Documents shall be used in preparing proposals; neither the Owner nor the Architect assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Construction Documents.
- B. Complete IFB documents and a Plan Holders Registration Form/Terms & Conditions may be viewed and downloaded at no charge from the Starr County website: www.co.starr.tx.us – click on Invitation for Bids “Starr County Juvenile Detention Center Upgrades”. Contact Abel Barrera (956-716-4800) if you have problems downloading documents.
- C. Electronic copies of the Bid/Contract Documents may also be obtained by emailing a request to rudym@milnet-archservices.com.
- D. The Owner or Architect in making copies of the Construction Documents available on the above terms, does so only for the purpose of obtaining proposals on the work and does not confer a license or grant for any other use.
- E. Complete sets of Drawings and Project Manuals are on file at the following locations and subcontractors may examine them there:

-Starr County Annex, 100 N. FM 3167, Suite 220, Rio Grande City, TX 78582

1.3 EXAMINATION:

- A. Offerors shall carefully examine the Construction Documents and the construction site to familiarize themselves with existing local conditions under which the Work is to be performed.
- B. Extra payments will not be authorized for work that could have been foreseen by careful examination of the site. Submission of a proposal shall constitute acceptance, by the offeror, of existing site conditions ***work in and around the existing Starr County Courthouse and Juvenile Detention Center*** as a part of the requirements for this work.
- C. Offerors shall carefully examine the Construction Documents to verify that they agree with the Table of Contents in the Project Manual, the Index of Drawings Sheet on the Drawings, and the Cover Page of all Addenda. Offerors shall be responsible for obtaining any pages or sheets which have been inadvertently left out during the printing process.
 - 1. All entities providing proposals on any portion of the work contained in the Construction Documents shall ascertain the completeness of the set of documents.

2. The Construction Documents are printed by an independent vendor and, although the Architect endeavors to check the documents for completeness, the Architect has, in the past, discovered missing or misplaced sheets in the Drawings and the Specifications.
3. Each entity receiving a set of Construction Documents shall check the indexes against the sheets or pages contained in the sets.
4. Should pages or sheets be found to be misplaced or missing, immediately notify the Architect who will give direction as to placement or provide the sheets or pages that are missing.
5. Failure to notify the Architect means the offeror is providing a proposal based on a complete set of Construction Documents.

1.4 INTERPRETATION OF CONSTRUCTION DOCUMENTS:

- A. Offerors shall promptly notify the Architect of any ambiguity, inconsistency or error which they may discover upon examination of the Construction Documents or of the site and local conditions.
- B. **Do not dimension the drawings. Any dimensions, questions, should be directed to the Architect.**
- C. Submit all questions regarding clarification or interpretation of Construction Documents to the Office of the Architects: ***MILNET ARCHITECTURAL SERVICES 608 S. 12TH ST., (attn: Rudy Molina, Jr.) AIA-(956) 688-5656; FAX NUMBER (956) 687-9289.***
- D. Submit all questions in writing. In the interest of time, requests may be made by telephone, but they must be confirmed in writing the same day. Replies to questions will be issued to all Offerors in the form of an Addenda. General contractor and subcontractors shall submit questions in writing forty eight (48) hours prior to opening of proposals.
- E. Make requests for interpretations as early as possible so as to allow adequate time to prepare and issue Addenda.
- F. All Offerors shall check with the Architect within ***six (6) hours*** prior to Opening of proposals to secure all Addenda. The Architect will not be responsible for oral clarification.

1.05 BASIS OF PROPOSALS:

- A. Proposals shall be on a lump sum basis for each and or combined proposal packages and shall include all costs for these projects as described and indicated by the Construction Documents. Basis for proposals shall be on brands, materials, processes, products, persons or organizations, etc.,
- B. Proposals shall include all unit price costs and all Alternate costs as indicated by the Construction Documents and Proposal Form.

1.06 ALTERNATES:

- A. The Owner may, at his option, elect to proceed with any or all Alternates as set forth in the Contract Requirements.
- B. Amount shown in proposal for each Alternate shall include profit, insurance, contingencies and other costs incidental to performance under under such Alternative.
- C. Amount shown in Proposal for each Alternate shall include the making of all changes and the installation of all materials and equipment necessary to the accomplishment of the Alternate requirements.

1.07 PROPOSALS:

- A. Proposals shall be made on unaltered Proposal Forms furnished by the Architect. No oral, telephone or personal Proposals will be considered. All blank spaces shall be properly filled in by typewriter or manually in ink.
- B. 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 written amount shall govern.
- C. Any alteration or erasure to information entered in the blank spaces must be initialed by the signer of the proposal.
- D. Original typed sheets shall be submitted, signed in longhand below the typed name of the person authorized to bind the offeror to a Contract.
- E. Where offeror is a corporation, Proposal must be signed with the legal name of the corporation followed by the name of the State of Incorporation and the legal signature of a person authorized to bind the corporation to a Contract.
- F. Failure to submit a proposal on the form requested, or the inclusion of conditions, limitations or provisions distorting the intent of the Construction Documents, will render the proposal irregular and subject to rejection.

1.08 SUBMITTALS:

- A. Submit Proposal, Security Bond and other required data in an opaque, sealed envelope. Submit proposal at the time and place shown in the Notice for competitive Sealed Proposals.
- B. Envelope shall be addressed to the Owner and identified with the Project Name and the name and address of the offeror.
- C. If the Proposal sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "PROPOSAL ENCLOSED" on the face thereof. No envelopes shall be opened until the date and time proposals are to be received.

1.09 MODIFICATION OR WITHDRAWAL OF PROPOSAL:

- A. A proposal may not be withdrawn or canceled by the offeror during the stipulated time period following the time and date designated for the receipt of Proposals, unless the award of Contract has been delayed more than sixty (60) days.
- B. Prior to the time and date designated for receipt of Proposals, Proposals submitted early may be modified or withdrawn only by notice to the party receiving Proposals at the place and prior to the time designated for receipt of Proposals.
- C. Modification of Proposals shall be in writing over the signature of the offeror or be by telegram; if by telegram, written confirmation over the signature of offeror must have been mailed and postmarked on or before the date and time set for receipt of proposals; it shall be so worded as not to reveal the amount of the original Proposal.
- D. Withdrawn Proposal may be resubmitted up to the time designated for the receipt of proposals provided that they are then fully in conformance with these Proposal Instructions.
- D. Security bond shall be in an amount sufficient for the proposal as modified or resubmitted.

1.10 CONSIDERATION OF PROPOSAL:

- A. Properly identified Proposals received on time will be considered.
- B. The Owner shall have the right to reject any or all Proposal and in particular to reject a Proposal not accompanied by any required security bond or data required by the Contract Documents or a Proposal in any way incomplete or irregular.
- C. The Owner shall have the right to waive any formality or irregularity in any proposal received.
- D. If the Owner accepts any Alternates, he shall have the right to accept them in any order or combination.
- E. It is the intent of the Owner to award a contract to the offeror submitting the proposal providing the “best value” to the Owner provided the Proposal has been submitted in accordance with the requirements of the Contract Documents, selection criteria and adopted by the Owner.

1.11 LOCATION AND ACCESS TO PREMISES:

- A. The project site location: Refer to Vicinity Drawings.
- B. The offeror shall have free access to the premises for the purpose of acquainting himself with the conditions, delivering equipment, and performing the work necessary to fulfill the contract with prior notice to Starr County officers. Offeror shall cooperate with the other contractors who may concurrently be working on the premises, integrating his work with that of others, all to the best interest of the total work and its orderly completion.

1.12 STATE SALES TAX:

- A. This project is exempt from state taxes. A sales tax exemption certificate may be obtained from the State Comptroller.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 00 25 16 — PRE-PROPOSAL MEETING

PART 1 - GENERAL

1.1 SITE INSPECTION:

- A. A site inspection to obtain a clear understanding of the project requirements is strongly encouraged but attendance remains at the proposers' discretion; however, site access is restricted. This will be the proposer's only opportunity to inspect the site prior to the Proposal Deadline Date.

1.2 PRE-PROPOSAL MEETING:

- A. A pre-proposal meeting will be held at the time and place specified below for the purpose of answering any questions that any proposer may have. This meeting will provide proposers an opportunity to familiarize themselves with the existing conditions. All prime contractors and major subcontractors are strongly advised to attend. Others are invited to attend.
- B. Date and Time: Wednesday, February 19, 2025 @ 10:00 A.M.
- C. Location: Starr County Annex Conference Room, Suite 211
100 N. FM 3167, Rio Grande City, Texas 78582

END OF SECTION

SECTION 00 42 00 — PROPOSAL FORM FOR COMPETITIVE SEALED PROPOSALS

RE: Sarr County Juvenile Detention Center Upgrades

ATTN: Maricela G. Ibarra, Director
Sarr County Federal and State Programs
100 N. FM 3167, Suite 220, Rio Grande City, Texas 78582

PART 1 - The Undersigned proposes to furnish all labor, services, materials, tools, and necessary equipment for the Sarr County Juvenile Detention Center Upgrades project (401 Britton Ave, Rio Grande City, Texas 78582) and to perform the work required for the construction of said project at the location set out by the Drawings, Project Manual and Specifications, in strict accordance with the Contract Documents for the complete work.

In submitting this Proposal, it is understood that this Proposal may not be altered or withdrawn for sixty {60} days from submission date and that the Owner has reserved the right to reject any and all Proposals.

The Undersigned certifies that this Proposal is made in good faith, without collusion or connection with any other person, persons, partnership, company, firm, association, or corporation offering on this work, for the following sum or prices to wit:

PART 2 - BASE PROPOSAL:

\$ _____ (Base proposal number)

\$ _____ (Base proposal words)

_____ (Base proposal words)

PART 3 - ALLOWANCE:

\$ 67,119.00 _____ (Allowance number)

\$ Sixty-Seven Thousand, One Hundred Nineteen Dollars _____ (Allowance words)

_____ (Allowance words)

PART 4 - ALLOWANCE: STEEL STRUCTURE FOR GENERATOR ENCLOSURE ROOF STRUCTURE

\$ 12,000.00 _____ (Allowance number)

\$ Twelve Thousand Dollars _____ (Allowance words)

_____ (Allowance words)

PART 5 - TOTAL:

\$ _____ (TOTAL number)

\$ _____ (TOTAL words)

_____ (TOTAL words)

PART 6 - ADD. ALTERNATE (Metalworks Securelock Tamper-Resistant Ceiling System):

\$ _____ (Add. Alternate number)

\$ _____ (Add. Alternate words)

_____ (Add. Alternate words)

The Undersigned hereby declares that he has visited the site and has carefully examined the Drawings, Specifications, Contract Documents and Proposal Documents related to the Work covered by his proposal.

Upon receipt of "*NOTICE TO PROCEED*", the Undersigned will immediately execute the formal contract (Agreement).

The Undersigned agrees to commence work within ten (10) days of receiving the Notice to Proceed and to substantially complete the work on or before **180 days after Notice to Proceed.**

The Contract required will be that Standard Form of the American Institute of Architects and shall provide for payment on accounts of ***ninety-five (95%)*** percent of the value monthly.

The Proposal, the Agreement, the Drawings, the General Conditions, Supplementary General Conditions, the Specifications and any Addenda shall all become a part of the Contract.

I hereby acknowledge receipt of the following Addendum:

BONDING COMPANY (IES):

(Name and address)

The Undersigned proposes to use the following Subcontractors, Manufacturers, Products, Material Suppliers for the principal portions of the work.

NAME(S) OF SUB-CONTRACTORS:

NAME(S) OF MANUFACTURERS:

NAME(S) OF MATERIAL SUPPLIERS:

Name of Company (Proposer)

Printed Name

Address

Title

City State

Signature

Telephone

Sworn to and subscribed before me this _____ day of _____, 20

SEAL

Notary Public in and for the State of Texas

SEAL (If Proposal is By a Corporation) _____

END OF SECTION

SECTION 00 43 00 – RANKING/SELECTION CRITERIA

1.0 Ranking /Selection Criteria

- A. The selection of offeror will be based on the following: Ranking/Selection Criteria. The Owner retains the right to apply the selection criteria as allowed in Texas Government Code, Sec. 2269.155.

1. Monetary Value: 50 Points Max

Based on Proposals Submitted and Pricing Differential

- 1.1 Base Proposal
- 1.2 Alternate Proposal(s)

2. Support Information: 50 Points Max

The following support information shall be submitted in separate sealed envelope attached with proposal. Provide a table of contents and separate each section with divider tabs. *Submit one (1) original and two (2) copies.*

2.1 Reputation / 2 points each – 8 points maximum

- 2.1A Provide contractor's qualification statement form AIA 305 (filled out and signed).
- 2.1B Provide information on company acting as surety on performance and payment bonds.
- 2.1C Provide three (3) letters of recommendation/references from previous clients.
- 2.1D How long has your company been in existence?

2.2 Past experience / 4 points each – 16 points maximum

- 2.2A List all relevant projects for which company has provided services in the past five (5) years. Provide name, telephone number and email address of contact person.
- 2.2B Describe past efforts in working with owner, its agents and design team in resolving construction issues. List a minimum of two (2) examples.
- 2.2C Describe history of providing fair assessment of change order pricing/additional pricing requests and proposed method for detailing cost documentation of these.
- 2.2D For the past five (5) completed projects, list the total number of change orders, additional pricing requests, change proposals/requests that were approved.

2.3 Contractor Personnel / 2 points each – 4 points maximum

- 2.3A Provide resume of proposed project manager, project superintendent and other key personnel. Provide current workload of project manager.
- 2.3B Address History and process for maintaining assigned personnel for the duration of the project.

2.4 Workforce / 4 points each – 4 points maximum

- 2.4A Provide list of work to be performed by contractor's own forces and list of proposed subcontractors. (Include all major trade subcontractors.)

2.5 Times Lines / 4 points each – 8 points maximum

- 2.5A Address history and proposed procedures to adhere to construction schedule from date of notice to proceed to completion of punchlist items.
- 2.5B Address history and procedure of securing contracts between general contractor and its subcontractors/suppliers in a timely manner.

2.6 Financial Strength / 2 points each – 4 points maximum

- 2.6A Provide a bank letter of reference regarding the company's financial strength.
- 2.6B Has the company or company's principals ever filed for bankruptcy?

2.7 Other relevant factors / 6 points maximum

- 2.7A Other relevant factors that the Owner would consider in selecting a general contractor.

END OF SECTION

SECTION 00 52 13 — AGREEMENT FORM - STIPULATED SUM

PART 1 - GENERAL

1.1 AGREEMENT FORM:

- A. The modified “Standard Form of Agreement Between Owner and Contractor where the Basis of Payment is a Stipulated Sum”, AIA Document A101, 2017 Electronic Format Edition, will be the form used as a Contract for this Project.
- B. General Condition AIA – A201 will be used in this project. See attached
- C. A copy of the Standard AIA Document may be examined at the office of the Architect. Copies may be purchased from the American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C., 20006.
- D. Modification may be made to the above Agreement & General Conditions A201 form or an Owner provided agreement and general conditions may be utilized. Either of which will be provided to contractor for review upon award of project, for final execution of the contract. See attached.
- E. Section 00 73 00 Supplementary Conditions forms part of this Agreement.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION



AIA[®] Document A201[™] – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

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

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

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

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

§ 1.1.2 The Contract

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

§ 1.1.3 The Work

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

§ 1.1.4 The Project

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

§ 1.1.5 The Drawings

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

§ 1.1.6 The Specifications

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

§ 1.1.7 Instruments of Service

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

§ 1.1.8 Initial Decision Maker

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

§ 1.2 Correlation and Intent of the Contract Documents

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

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining

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

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

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

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

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

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

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

§ 1.6 Notice

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

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

§ 1.7 Digital Data Use and Transmission

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

§ 1.8 Building Information Models Use and Reliance

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

information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

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

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

§ 2.2 Evidence of the Owner's Financial Arrangements

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

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

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

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

§ 2.3 Information and Services Required of the Owner

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

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

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

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the

site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

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

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

§ 2.4 Owner's Right to Stop the Work

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

§ 2.5 Owner's Right to Carry Out the Work

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

ARTICLE 3 CONTRACTOR

§ 3.1 General

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

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

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

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

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

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

capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

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

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

§ 3.3 Supervision and Construction Procedures

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

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

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

§ 3.4 Labor and Materials

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

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

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

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes

remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

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

§ 3.6 Taxes

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

§ 3.7 Permits, Fees, Notices and Compliance with Laws

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

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

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

§ 3.7.4 Concealed or Unknown Conditions

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

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

§ 3.8 Allowances

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

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

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

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

§ 3.9 Superintendent

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

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

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

§ 3.10 Contractor's Construction and Submittal Schedules

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

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

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

§ 3.11 Documents and Samples at the Site

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

§ 3.12 Shop Drawings, Product Data and Samples

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

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

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

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

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

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

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

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

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

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

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

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

time and in the form specified by the Architect.

§ 3.13 Use of Site

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

§ 3.14 Cutting and Patching

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

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

§ 3.15 Cleaning Up

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

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

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

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

§ 3.18 Indemnification

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

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

ARTICLE 4 ARCHITECT

§ 4.1 General

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

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

§ 4.2 Administration of the Contract

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

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

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

§ 4.2.4 Communications

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

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

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

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

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

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

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the

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

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

§ 5.3 Subcontractual Relations

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

§ 5.4 Contingent Assignment of Subcontracts

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

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

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

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

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

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

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate

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

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

§ 6.2 Mutual Responsibility

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

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

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

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

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

§ 6.3 Owner's Right to Clean Up

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

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

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

§ 7.2 Change Orders

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

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

§ 7.3 Construction Change Directives

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

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

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

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

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

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

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

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

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

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

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The

Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

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

§ 7.4 Minor Changes in the Work

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

ARTICLE 8 TIME

§ 8.1 Definitions

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

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

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

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

§ 8.2 Progress and Completion

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

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

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

§ 8.3 Delays and Extensions of Time

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

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

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

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable

by the Owner to the Contractor for performance of the Work under the Contract Documents.

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

§ 9.2 Schedule of Values

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

§ 9.3 Applications for Payment

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

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

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

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

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

§ 9.4 Certificates for Payment

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

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The

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

§ 9.5 Decisions to Withhold Certification

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

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

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

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

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

§ 9.6 Progress Payments

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

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

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

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers

to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

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

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

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

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

§ 9.7 Failure of Payment

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

§ 9.8 Substantial Completion

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

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

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

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

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

§ 9.9 Partial Occupancy or Use

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

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

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

§ 9.10 Final Completion and Final Payment

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

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

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

constitute a waiver of Claims.

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

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

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

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

§ 10.2 Safety of Persons and Property

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

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

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

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

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

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

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

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

§ 10.2.8 Injury or Damage to Person or Property

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

§ 10.3 Hazardous Materials and Substances

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

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

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

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

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

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

§ 10.4 Emergencies

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the

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

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

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

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

§ 11.2 Owner's Insurance

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

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

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

§ 11.3 Waivers of Subrogation

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

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

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

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

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

§ 11.5 Adjustment and Settlement of Insured Loss

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

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

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

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

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

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

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

Contractor's expense.

§ 12.2.2 After Substantial Completion

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

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

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

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

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

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

§ 12.3 Acceptance of Nonconforming Work

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

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

§ 13.2 Successors and Assigns

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

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

§ 13.3 Rights and Remedies

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

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

§ 13.4 Tests and Inspections

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

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

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

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

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

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

§ 13.5 Interest

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

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

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

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

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

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

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

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

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

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

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

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

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

§ 14.3 Suspension by the Owner for Convenience

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

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

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

§ 14.4 Termination by the Owner for Convenience

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

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

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

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

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

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

§ 15.1.2 Time Limits on Claims

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

§ 15.1.3 Notice of Claims

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

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

§ 15.1.4 Continuing Contract Performance

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

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

§ 15.1.5 Claims for Additional Cost

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

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section

15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

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

§ 15.1.7 Waiver of Claims for Consequential Damages

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

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

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

§ 15.2 Initial Decision

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

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

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

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

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

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

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

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

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

§ 15.3 Mediation

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

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

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

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

§ 15.4 Arbitration

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

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

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

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly

consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

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

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

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

SECTION 00 61 00 — PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND:

- A. The Contractor shall, prior to the execution of the Contract, furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder in the amount of 100% of the Contract Price covering 100% performance and 100% payment, and with such sureties secured through the contractor's usual sources as may be agreeable to the parties.
- B. The Contractor shall deliver the required bonds to the Owner not later than the date of execution of the Contract, or if the work is commenced prior thereto in response to a letter of intent, the Contractor shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be finished.
- C. The Contractor shall require the Attorney-In-Fact who executes the required bonds on behalf of the surety to affix thereto a certificate and current copy of his Power of Attorney.
- D. Any Payment Bond and Performance Bond furnished pursuant to the provisions of Art. 5160, Vernon's Texas Civil Statutes, connected with this project, shall be furnished by a corporate surety or corporate or corporate sureties in accordance with Article 7.19-1, Vernon's Texas Insurance Code, that has a stated capital and surplus (as reported by it to the Texas Insurance Commission in its most recent report) that is in excess of ten times the stated amount of the Payment Bond or the Performance Bond. Provided however, that if any Payment Bond or any Performance Bond is in an amount in excess of ten percent (10%) of the surety company's capital and surplus (as reported to the Texas Insurance Commission in its most recent report), as a condition to accepting the bond, the Owner must receive written certification and information, satisfactory in form and substance to the Owner, that the surety company has reinsured the portion of the risk that exceeds ten percent (10%) of the surety company's capital and surplus, with one or more reinsurers who are duly authorized, accredited or trusted to do business in the State of Texas. For the purpose of this requirement, any amount reinsured by any reinsurer may not exceed ten percent (10%) of the reinsurer's capital and surplus (as reported to the Texas Insurance Commission by the reinsurer in its most recent report). In the event there is one or more reinsurer, the surety company must provide all necessary information and certification related to the current financial condition of the surety company and any and all reinsurers required by the Owner, together with copies of all reinsurance contracts with the surety company, before any such Payment Bond and Performance Bond is eligible to be considered acceptable by the Owner.
- E. ALL CONTRACTORS SHALL SUBMIT THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE CORPORATED SURETIES PROVIDING THE PAYMENT BOND AND PERFORMANCE BOND AND THE LOCAL AGENT.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 00 62 76.13 — TAX EXEMPT ORGANIZATION CERTIFICATE

PART 1 - GENERAL

1.1 DEFINITION

- A. This Contract is to be performed for an exempt organization as defined by Title 2; Subtitle E; Chapter 150 of the Texas Limited Sales, Excise and Use Tax Act and Section 151.311 of the State Statutes. The Owner will furnish the Contractor proof or Certificate of Exemption upon award of contract.
- B. Proposer shall not include sales tax in their Proposal.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 00 73 00 — SUPPLEMENTARY CONDITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: SUPPLEMENTARY CONDITIONS

- A. The Supplementary Conditions modify, change, delete from or add to the General Conditions and shall apply to each and every Section of the Work as though written in full therein.
- B. The following paragraphs and subparagraphs take precedence over the General Conditions. Where any part of the General Conditions is modified or deleted by the Supplementary Conditions, the unaltered provisions remain in effect.
- C. Paragraph numbers and titles refer to like numbers and titles in the General Conditions.

1.2 EXECUTION, CORRELATION AND INTENT

1.3 Add the following subparagraphs.

- 1.4 1.2.6 Scope paragraphs placed at the beginning of the SECTIONS present a brief indication of the principal Work included in that SECTION, but do not limit Work to subject mentioned nor purport to itemize Work that may be included.

- 1.5 The Relation of Specifications and Drawings shall be equal in authority and priority. Should they disagree in themselves, or with each other, bids shall be based on the most expensive combination of quality and quantity of work indicated. The appropriate Work, in the event of the above mentioned disagreements, shall be determined by the Architect, at no additional cost to the Owner.

- 1.6 1.2.8 Failure to report a conflict in the Contract Documents, prior to opening of Proposal, shall be deemed evidence that the Contractor has elected to proceed in the more expensive manner, at no additional cost to the Owner.

- A. 1.2.9 The Specifications have been partially “streamlined” and some words and phrases have been intentionally omitted. Missing portions shall be supplied by inference as with notes on drawings.
- B. 1.2.10 The words “approved”, “inspected”, “directed”, “selected”, and similar words and phrases shall be presumed to be followed by “by Architect”. The words “satisfactory”, “submitted”, “reported”, and similar words and phrases shall be presumed to be followed by “to Architect”. Words like “install”, “provide”, “locate”, “furnish”, and “supply” shall be construed to include complete furnishing and installing of construction. Words like “Bids”, “Bidders”, shall be construed to be “Proposals”, “Proposers”, or “offers”, “offerors”, respectively.
- C. INFORMATION AND SERVICES REQUIRED OF THE OWNER
- D. Delete 2.2.5 and replace with the following subparagraph.
- E. 2.2.5 Deleted

F. LABOR AND MATERIALS

G. Add the following subparagraphs 3.4.3 and 3.4.4 to 3.4:

H. After the Contract has been executed, the Owner and the Architect will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 1 of the Specifications).

I. By making requests for substitutions based on subparagraph 3.4.3 above, the Contractor:

1. Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
2. Represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
3. Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects, all at no additional cost to the Owner.

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.3.1 CHANGE TO READ:

Mutual acceptance of a lump sum properly itemized in accordance with 7.3.6.1, 7.3.6.2 and 7.3.6.3. Items listed in 7.3.6.4 and 7.3.6.5 shall be a part of the overhead scheduled 7.3.10 following. Items shall be supported by sufficient substantiating data to permit evaluation;

7.3.6 In the first sentence, delete the words “a reasonable allowance for overhead and profit” and substitute “an allowance for overhead and profit in accordance with Clauses 7.3.10.1 through 7.3.10.6 following:

7.3.6.4DELETE the final “and” then add the following to the sentence: are a part of overhead schedule in 7.3.10 following”.

7.3.6.5 ADD the following to the sentence: “are apart of overhead schedule in 7.3.10 following”.

ADD the following subparagraph 7.3.10 to 7.3:

7.3.10 In subparagraph 7.3.6, the allowance for the combined and profit included in the total cost to the Owner shall be based on the following schedule:

1. For the Contractor, for Work performance by the Contractor’s own forces, 10 percent of the cost.
2. For the Contractor, for Work performance by the Contractor’s contractor, 6 percent of the amount due to the Sub-subcontractor.
3. For each Subcontractor or Sub-subcontractor involved, for Work performed by that Subcontractor’s or Sub-subcontractor’s own forces, 10 percent of the cost.
4. For each Subcontractor, for Work performed by the Subcontractor’s, Sub-subcontractor’s, 6 percent of the amount due the Sub-subcontractor.
5. Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.6.
6. In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over \$500.00 be approved without such itemization.

8.1 DEFINITIONS

Add the following subparagraph.

8.1.5 The term working Day as used in the Contract Documents for extensions of time shall mean normal working day excluding weekends and legal holidays.

8.3 DELAYS AND EXTENSIONS OF TIME

Delete paragraph 8.3.2 and replace with the following subparagraph.

8.3.2 Any claim for extension of time shall be made in writing to the Architect not more than ten (10) days after the commencement of the delay; otherwise, it shall be waived. In case of a continuing delay only one

claim is necessary. In case of claims for extensions of time because of adverse weather, such extensions of time shall be granted only when such adverse weather prevented the execution of major items of Work on normal working days and exceeds the number of days included in the Contract time. The Contractor shall provide an estimate of the probable effect of such delay on the progress of the Work. In the event an extension of time is granted such extension shall be the complete claim allowed. Contractor shall not be entitled to additional compensation such as, but not limited to, compensable extended overhead or lost profit.

9.6 PROGRESS PAYMENTS

Add the following subparagraph to 9.6.1

1. Unless otherwise indicated in the Agreement, the Owner will pay ninety-five (95%) percent of the amount due the Contractor on account of progress payment until final payment.

Add the following paragraphs to 9.11 to Article 9:

9.11 LIQUIDATED DAMAGES:

9.11.1 If the Contractor neglects, fails or refuses to complete the Work within the time specified in the Contract, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as part consideration of the awarding of this Contract, to pay the Owner the amount of ***FIVE HUNDRED DOLLARS (\$500.00)*** not as a penalty but as a liquidated damages for such breach of Contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the Work.

9.11.2 The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would, in such event, sustain.

9.11.3 TIME SPECIFIED IN CONTRACT IS AS FOLLOWS:

The Undersigned agrees to commence work within ten (10) days of Notice to Proceed and to substantially complete the work on or before 90 calendar days after the date of Notice to Proceed.

11.1 Article 11.1 Modify to include the following:

The Contractor shall furnish three (3) copies of insurance certificates to the Architect's office two (2) days after award of the project and before signing of the contract. The Certificate of Insurance shall include thirty (30) Day Notice of Cancellation; Architect and Owner shall receive the same notice in regard to any policy changes. Owner and Architect shall be named as additional insured by the Contractor but not with respect to payment of premiums due under Contractor's policies. Coverage shall include any off site-work on adjacent public or private property.

Insurance Company/Carrier issuing the certificates must be listed by A.M. Best and have an "A" rating or better and based in the United States Mainland.

The insurance as required in Article 11.1 shall have "Minimum Limits" as follows:

- A. WORKER'S COMPENSATION INSURANCE: Statutory Requirements-
 - 1. All States Endorsements (Broad)
 - 2. Voluntary Compensation
 - 3. Waiver of Subrogation Endorsement
- B. MINIMUM EMPLOYER'S LIABILITY: \$100,000/\$100,000/\$500,000
- C. COMPREHENSIVE GENERAL LIABILITY INSURANCE MINIMUM LIABILITY AND COVERAGE:
 - 1. Bodily Injury \$500,000 each person/\$500,000 each occurrence
 - 2. Property Damage \$100,000 each occurrence/\$100,000 aggregate

OR-

 - 3. \$500,000 Combined Single Limit Per Occurrence Bodily Injury and Property Damage.
 - a. Premises and operations coverage
 - b. Explosion and collapse hazard coverage
 - c. Underground hazard coverage
 - d. Products/completed operation hazard coverage with limits and coverage continuing one (1) year after job completion.
 - e. Broad Form property damage coverage
 - f. Personal injury coverage
 - g. Waiver of subrogation endorsement
 - h. Contractual liability (Broad Form) coverage
 - i. Independent contractors coverage (Owners, Architects, and Contractors protective)

NOTE: If General Liability coverage is written on a "Claims Made" basis, the Certificate of Insurance should so indicate. If so written, Contractor agrees that coverage so certified beyond job completion and that coverage written will apply to claims made DURING CONSTRUCTION AND FOR ONE (1) YEAR THEREAFTER.

D. AUTOMOBILE LIABILITY INSURANCE with minimum limits of:

1. Bodily Injury: \$250,000 each person/\$500,000 each occurrence
2. Property Damage: \$250,000 each occurrence/\$500,000 Combined Single Limit per Occurrence Bodily Injury and Property Damage.
3. Automobile Liability Insurance shall include coverage for owned, non-owned, and hired vehicles with limits not less than shown above.

E. OWNER'S AND CONTRACTOR'S PROTECTIVE LIABILITY:

1. Bodily Injury \$500,000 Single limit each occurrence
2. Property Damage \$250,000 each occurrence/\$250,000 aggregate

F. UMBRELLA LIABILITY:

Minimum combined single limits \$100,000 with same inception and expiration dates as underlying liability policies and with coverage no less broad than in primary program.

G. BUILDER'S RISK INSURANCE:

The Contractor shall FURNISH AND PAY FOR and issue a Certificate of Builder's Risk Coverage to the Owner/Architect in accordance with the General Conditions and Conditions of the Contract.

H. ARTICLE 11.4: PERFORMANCE BOND AND PAYMENT BOND:

Delete in its entirety and substitute the following:

11.4.1: Prior to signing of the Contract, the CONTRACTOR, at HIS/HER OWN EXPENSE, shall furnish a Performance Bond, and a Labor and Materials Payment Bond for one hundred (100%) percent of the Contract price on such form and with such sureties as the Owner may approve. ***Surety company furnishing the Bond must be listed by A.M. BEST and have an "A" rating or better and be based in the United States Mainland and authorized to provide such bonds on public work in the State of Texas.***

- J. Any Payment Bond and Performance Bond furnished pursuant to the provisions of Art. 5160, Vernon's Texas Civil Statutes, connected with this project, shall be furnished by a corporate surety or corporate or corporate sureties in accordance with Article 7.19-1, Vernon's Texas Insurance Code, that has a stated capital and surplus (as reported by it to the Texas Insurance Commission in its most recent report) that is in excess of ten times the stated amount of the Payment Bond or the Performance Bond. Provided however, that if any Payment Bond or any Performance Bond is in an amount in excess of ten percent (10%) of the surety company's capital and surplus (as reported to the Texas Insurance Commission in its most recent report), as a condition to accepting the bond, the Owner must receive written certification and information, satisfactory in form and substance to the Owner, that the surety company has reinsured the portion of the risk that exceeds ten percent (10%) of the surety company's capital and surplus, with one or more reinsurers who are duly authorized, accredited or trusted to do business in the State of Texas. For the purpose of this requirement, any amount reinsured by any reinsurer may not exceed ten percent (10%) of the reinsurer's capital and surplus (as reported to the Texas Insurance Commission by the reinsurer in its most recent report). In the event there is one or more reinsurer, the surety company must provide all necessary information and certification related to the current financial condition of the surety company and any and all reinsurers required by the Owner, together with copies of all reinsurance contracts with the surety company, before any such Payment Bond and Performance Bond is eligible to be considered acceptable by district.

1.7 COMPLIANCE WITH FEDERAL GRANT REQUIREMENTS

- A. The County will search a database maintained by the Texas State Comptroller which contains relevant vendor information. A contract may not be entered into with an entity that is identified therein. Search results shall be incorporated for all purposes as part of any re-sulting agreement entered into by the parties. The Offeror shall fol-low all federal, state, and local laws, requirements, rules, codes, or-dinances, regulations and Starr County Policy & Procedures applica-ble to their proposed goods and/or services, including, but not lim-ited to those addressed within this procurement packet, the resulting agreement and the following:

- B. Attestation Terrorist Organizations - TEX. GOVT. CODE CH. 2252. Pursuant to the Texas Government Code, including but not limited to Chapter's 2252, 806 and 807, the Offeror warrants, represents, certifies and attests that, by submitting a response to this procurement packet and/or at the time of execution of this Contract, Agreement, or supplemental agreement thereafter, neither the Offeror, nor any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of the same (i) engages in business with Iran, Sudan, or any foreign terrorist or (ii) is a company listed by the Texas Comptroller of Public Accounts.
- C. Breach of Ethics. Contracts awarded hereunder shall be in compliance with Tex. Loc. Govt. Code Chapter 171: Regulation of Conflicts of Interest of Officers of Municipalities, Counties and Certain Other Local Governments.

It shall be a breach of ethics to offer, give, or agree to give any elected official, department head or employee, or former elected official, department head or employee, of the County, or for any elected official, department head or employee or former elected official, department head or employee of the County, to solicit, demand, accept or agree to accept from another person, entity or organization, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation or any part of a program requirement or purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy, or other particular matter pertaining to any program requirement or a contract or subcontract, or to any solicitation or response to a request therefore pending before any department or agency of the County.

It shall be a breach of ethics for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor for any contract for the County, or any person associated therewith, as an inducement for the award of a subcontract or order.

- D. Bonds. If this procurement packet requires submission of bid bond or proposal guarantee, and performance and payment bonds, an explanation of these requirements will be detailed on the "Projects Requirements Acknowledgement". Responses submitted without the required bond or cashier's checks may be deemed unresponsive, thus disqualified from participation.
- E. Boycott Energy Companies Verification – TEX. GOVT. CODE 2274. In accordance with changes to the law from the 87th Legislature in 2021, a for-profit company, not including a sole proprietorship, with ten or more full-time employees, is required to verify in writing that it does not boycott energy companies, and it will not boycott energy companies during the term of the Contract, if it is a contract for goods or services that has a value of at least \$100,000 that is paid wholly or partly from public funds of the governmental body. Written verification may be provided by signing the Legal Notice Declarations page. Please provide a written notification if your company is unable to provide the written verification referenced above.

As per Tex. Gov't. Code §809.001(1), "Boycott energy company" means "without an ordinary business purpose, refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with a company because the company: (A) engages in the exploration, production, utilization, transportation, sale, or manufacturing of fossil fuel-based energy and does not commit or pledge to meet environmental standards beyond applicable federal and state law; or (B) does business with a company described by Paragraph (A)".

As per Ch. 2274(c), this verification requirement does not apply to the County if it determines that this requirement is inconsistent with the County's constitutional or statutory duties related to the issuance, incurrence, or management of debt obligations or the deposit, custody, management, borrowing, or investment of funds.

- F. Boycott Israel Verification - TEX. GOVT. CODE 2270. In accordance with the Texas Government Code, including but not limited to Chapters 2270 and 808, a company, other than a sole proprietorship, with ten

or more full time employees is required to certify in writing that it does not boycott Israel and will not boycott Israel during the term of the Contract, if the Contract has a value of \$100,000 or more.

- G. **Certification Regarding Debarment, Suspension Ineligibility, and Voluntary Exclusion.** The Offeror warrants and represents by execution of an award from their response to this procurement packet that it is not debarred, suspended, or otherwise excluded from or ineligible for participation in any Federal programs, or state assistance, as described under Executive Order 12549, "Debarment and Suspension." The Offeror agrees to include this certification in all contracts between itself and any subcontractors in connection with the services performed under any subsequent Contract or Agreement arising from this award. The Offeror also acknowledges that it is their sole responsibility to immediately notify Starr County, in writing, if they or a subcontractor is not in compliance with Executive Order 12549 during the term of this contract. Further, Offeror agrees to refund Starr County for any payments made to the contractor while ineligible. Pursuant to federal regulation 45 CFR Part 76, the Offeror is required to furnish a certification or acknowledgement stating that they are free from suspension and debarment through registration on System for Award Management at <http://www.sam.gov> with their response.
- H. **Davis-Bacon Act.** All contractors must comply with the Davis-Bacon Act, ensuring workers are paid prevailing wages determined by the U.S. Department of Labor. Contractors must provide certified payroll records. No employee, officer, or agent of Starr County may participate in the selection, award, or administration of a contract if a real or apparent conflict of interest exists as per 2 CFR 200.318 (c).
- I. **Disclosure of Conflict of Interest.**
- J. **As an Offeror.** Pursuant to Texas Local Government Code, Chapter 176, an Offeror must disclose an interest between the Offeror, the Offeror's employees and any Starr County employees arising from relationships within the first degree of consanguinity or affinity. A financial interest arises if the County's elected official, department head, or employee, or a member of their family, received any gifts valued in excess of \$250 during the preceding twelve (12) month period, or employment of any County's elected official, department head, or employee, or the County official's family member.

The Offeror shall not use funds to directly or indirectly pay any person for influencing or attempting to influence any County employee or official in connection with the awarding of any contract or the extension, continuation, renewal, amendment or modification of any contract.
- K. **Certificate of Interested Parties (Form 1295).** Starr County cannot enter into a contract until Form 1295 is submitted, as Texas law, including, but not limited to Tex. Govt. Code Ch. 2252, Title 1 Tex. Ethics Comm. Rules – Title 1, sec. 46 and the Tex. Admin. Code, requires all parties who enter into any contract with the County which must be approved by its governing body, to disclose all interested parties. Form 1295 must be completed in its entirety through the Texas Ethics Commission at the following website: https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm prior to awarding the Contract. Failure to do so may result in delay of award, or deem your response unresponsive, thus disqualified from participation.
- L. **Collusion.** The Offeror affirms that by responding to any solicitation made by Starr County, it has not communicated directly or indirectly the response made to any competitor or any other person engaged in such line of business. Any or all responses may be rejected if the County believes that collusion exists among the Offerors, and/or the County believes prices provided by the Offerors are inappropriately unbalanced. "Proposer's Affidavit" must be included in the response.
- M. **Consultants Excluded from Competition.** An outside Consultant or Contractor is prohibited from submitting a response for goods or services requested on a Starr County project of which the Consultant or Contractor was a designer or other previous contributor, assisted in developing or drafting specifications, requirements, statements of work, or requests for goods and/or services must be excluded from competing for such procurements. If such, a Consultant or Contractor submits a response, that response shall be prohibited, and disqualified on the basis of conflict of interest, no matter when the conflict is discovered by Starr County.

- N. Disclosure of Interested Parties (Form CIQ). Offeror must fully disclose the existence of any relationships as defined above in its response to this procurement packet. The "Conflict of Interest Questionnaire (CIQ)", must be filed with the Starr County Clerk, located inside the Starr County Courthouse no later than the seventh business day after the date the person becomes aware of facts that require the statement to be filed. Starr County Clerk contact information may be found at <https://www.co.starr.tx.us/page/starr.County.clerk>. Completion and submission of Form CIQ is the sole responsibility of the Offeror. Additionally, the Offeror must immediately notify Starr County if the information provided in its response changes at any time.
- O. Disclosure to Report Lobbying. When applicable, pursuant to 31 U.S.C.A. §1352(2003), if at any time during the contract term funding to Contractor exceeds \$100,000.00, Contractor shall file with the County the Federal Standard Form LLL titled "Disclosure Form to Report Lobbying" as detailed in "2 C.F.R. § 200".
- P. Discrimination Against Firearm Entities or Trade Associations Verification - Tex. Gov't. Code Ch. 2274. In accordance with changes to the law from the 87th Legislature in 2021, a for-profit company, not including a sole proprietorship, with ten or more full-time employees, is required to verify in writing that it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association and will not discriminate against a firearm entity or firearm trade association during the term of the Contract, if it is a contract for goods or services that has a value of at least \$100,000 that is paid wholly or partly from public funds of the governmental body. Written verification may be provided by signing the Legal Notice Declaration page. Please provide a written notification if your company is unable to provide the written verification referenced above.
- Q. Disqualification of Offeror. By submitting a response to this request, an Offeror offering to sell supplies, materials, services, or equipment to Starr County certifies that the Offeror has not violated the antitrust laws of this state codified in Texas Business and Commerce Code §15.01, et seq., as amended, or the federal antitrust laws. If multiple submissions are made by an Offeror and after they are opened, the Offeror requests to withdraw one of the submissions is requested to be withdrawn, the result will be that all of the responses submitted by that Offeror will be withdrawn; however, nothing herein prohibits an Offeror from submitting multiple responses for different products or services.
- R. Historically Underutilized Business/Disadvantaged Business Enterprises. The County is committed to ensuring that Historically Underutilized Businesses (HUB) and Disadvantaged Business Enterprises (DBE) such as small business enterprises (SBE), minority and women-owned business enterprises (MWBE) receive a fair and equal opportunity for participation in the County's procurement process. The County encourages the use of these enterprises both as prime and subcontractors as listed in "HUB Declaration".

When federal funds are expended by the County, the County will take affirmative steps set forth in 2 CFR 200.321 to assure that small, minority, women-owned businesses and labor surplus area owned firms are used when possible. Pursuant to 2 CFR 321, the County requires that a prime contractor who uses subcontractors take affirmative steps set forth in 2 CFR 200.321, including:

- a. Placing qualified small and minority business and women's business enterprises on solicitation lists;
- b. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
- c. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
- d. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and

e. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

f. Nothing in this section is to be construed to require the County to award a contract other than as required by law and Starr County policies and procedures.

When procurement is related to road construction projects with the Texas Department of Transportation (TxDOT), all respondents must submit their HUB/DBE plans as part of their submission to be qualified to participate.

- S. Independent Contractor. Offeror must comply with all applicable Starr County policies and with any applicable federal, state, or local laws, regulations, orders, or ordinances applicable to the Services provided by Offeror under a contract entered into by the parties. Notwithstanding the foregoing sentence, Offeror represents and maintains that Offeror is an Independent Contractor and is not an employee of the County, or any agency thereof, and represents and warrants that Offeror does not desire or request any fringe benefits provided to employees of County, and/or any agency of the County, including but not limited to benefits associated with Starr County's Civil Service Program. Any contract entered into between the parties and the performance of the same does not create an agency relationship or master servant relationship. Offeror agrees to be responsible for any federal income tax, withholding or social security tax liability that might arise from payments received under a contract. Offeror will incur no financial obligation on behalf of the County without prior written approval of the County. Offeror will be responsible for all personal and professional expenses, including, but not limited to, membership fees and dues and expenses of attending conventions and meetings. The County will have no right to direct or control the details, manner or means by which Offeror or its affiliates provide the Services, except as otherwise set forth in this packet and/or any contract entered into by the parties. Offeror agrees to not take any action that is detrimental to, or not in the best interest of the County.
- T. Nondiscrimination. By submitting a response to this procurement packet, the Offeror certifies that it will conform to the provisions of Title IV of the Federal Civil Rights Act of 1964 and 28 CFR 42.203, as amended and related state and federal law. Offeror, during the performance of this contract, will not discriminate against any employee or applicant for employment because of race, religion, color, national origin, sex, age, disability or any other protected class under law (except as allowed in the case of bona fide occupational qualifications).
- U. Texas Public Information Act. The Offeror understands and agrees that Starr County is a governmental body for purposes of the Public Information Act, codified as Chapter 552 of the Texas Government Code and as such is required to release information in accordance with the Public Information Act (the "Act"). Starr County must rely on advice, decisions and opinions of the Attorney General of the State of Texas relative to the disclosure of data or information. Submissions will be kept confidential in accordance with the Act and applicable law, and submissions are subject to inclusion into the public record after award. To the extent permitted by law, Offeror may request in writing non-disclosure of any information that it considers to be confidential, proprietary, and/or trade secret in its submission. Such data shall accompany the submission, be readily separable from the response, and shall be CLEARLY MARKED "CONFIDENTIAL, PROPRIETARY and/or TRADE SECRET". Starr County will make reasonable efforts to provide Offeror notice in accordance with the Act in the event the County receives a request for information under the Act for information that the Offeror has marked as indicated above. E-mail addresses provided by Offeror to the County as part of its response to this procurement packet are not confidential. Additionally, Offeror provides its affirmative consent to the disclosure of its email addresses, including from its employees, officers, and agents acting on its behalf, that are provided to Starr County. This consent shall survive termination of this agreement and apply to any e-mail address provided in any form for any reason whether related to this procurement packet or otherwise.
- V. Title VI Notice. The County of Starr, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat.252, 42 U.S.C. §§2000d to 2000d-4) and the Regulations, hereby notifies all respondents that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit Bids in response to

this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award. Further, "Title VI" has been broadened by related statutes, regulations and executive orders as found in Appendices "A" through "E". Offeror agrees to comply with Title VI as may be required.

- W. Buy America Compliance.
- X. All materials and supplies used in this project must comply with the Buy America Act under 49 CFR Part 661, prioritizing domestic sourcing.
- Y. ATTACHMENTS:
 - A- INSURANCE REQUIREMENTS
 - B- COI QUESTIONNAIRE
 - C- HUB DECLARATION
 - D-CERTIFICATION REGARDING DEBARMENT
 - E- TITLE VI APPENDICES
 - F-2 CFR 200
 - G- FHWA 1273
 - H- DAVIS BACON ACT WAGE DETERMINATIONS
 - I- PROPOSER'S AFFIDAVIT

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

Insurance Requirements
Applicable to the Acquisition of Goods and/or Services
(Other than Professional Services)

The Bidder awarded the contract shall furnish proof of insurance, which will also include any subcontractor that is subcontracted by the bidder in at least the following limits, to be in place prior to providing any services under this Contract and to continue at all times in force in effect during the term of this Contract and any extension hereof:

1. **Comprehensive General Liability insurance** policy with limits of not less than Five Hundred Thousand Dollar (\$500,000.00) providing additional coverage to all underlying liabilities of County. Policy shall cover, but not be limited to, Bidder's activities in providing the Services for County; all persons, vehicles, equipment connected with providing Services; and theft or loss of Bidder's property.
 2. **Automobile liability insurance** policy, covering all owned, non-owned or hired/leased automobiles, with limits of at least Three Hundred Thousand Dollars (\$300,000.00) per person and Five Hundred Thousand Dollars (\$500,000.00) per occurrence. Coverage should include injury to or death of persons and property damage claims with limits up to five Hundred Thousand (\$500,000.00) arising out of the services provided to County hereunder.
 3. **Uninsured/Underinsured motorist coverage** in an amount equal to the auto liability limits set forth immediately above;
 4. **Workers Compensation Insurance:** Workers Compensation insurance in amounts established by Texas law, unless the Bidder is specifically exempted from the Texas Workers Compensation Act, Texas Labor Code Chapter 401, et. seq. Workers Compensation policies must include other States Endorsement to include TEXAS if the business is domiciled outside the State of Texas.
- *Bidder shall obtain and maintain any and all other insurances which may be necessary in providing the good/service applicable to this procurement or are otherwise required by law.*
 - *Any and all insurance policies shall be in amounts prescribed by law or otherwise specified by the County, but in no event less than the minimum amounts prescribed by law.*

Additional Insurance Requirements:

- a. Bidder shall furnish to County certificate(s) of insurance, and all renewals throughout the duration of the Project, issued by the insurer that such insurance is in full force and effect.
- b. Certificates of insurance shall be submitted to County for approval prior to any services being performed by Bidder.
- c. **Starr County will only accept certificates of insurance on an Acord form (as attached hereto).**

Page 2 of 2: Continuation of Exhibit “C”: Insurance Requirements Applicable to the Acquisition of Goods and/or Services (Other than Professional Services)

- d. For each policy, except Workers’ Compensation, Bidder shall name the County as an additional insured.
- e. Each policy of insurance required hereunder shall extend for a period equivalent to, or longer than the term of the Contract, and any insurer hereunder shall be required to give at least thirty (30) days written notice to the County prior to the cancellation of any such coverage on the termination date, or otherwise.
- f. This Contract shall be automatically suspended upon the cancellation, or other termination, of any required policy of insurance hereunder, and such suspension shall continue until evidence of adequate replacement coverage is provided to County. If replacement coverage is not provided within thirty (30) days following suspension of the Contract, this Contract shall automatically terminate.
- g. All insurance policies will be endorsed to provide a waiver of subrogation in favor of the County.
- h. County reserves the right to review the insurance requirements of this section during the effective period of the contract and to require adjustment of insurance coverage and their limits when deemed necessary and prudent by County based upon changes in statutory law, court decisions, or the claims history of the industry as well as the Bidder.
- i. Insurance policies shall be obtained at Bidder’s sole expense. County does not maintain and will not obtain insurance of any type to protect Bidder against loss, damage or injury that may in any way result from Bidders performance of the services.
- j. In no event shall the County be liable for any loss, damage to or destruction of any property belonging to the Bidder.
- k. Bidder is responsible for ensuring all required insurance policies are valid for the duration of the contract.
- l. All insurance policies are to be issued by an insurance company authorized to do business in the State of Texas and acceptable to County.
- m. Bidder shall make any other insurance documentation available to County upon request.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME		
	PHONE (A/C, No. Ext.)	FAX (A/C, No.)	
	E-MAIL		
	ADDRESS		
INSURED	INSURER(S) AFFORDING COVERAGE		NAIC #
	INSURER A:		
	INSURER B:		
	INSURER C:		
	INSURER D:		
	INSURER E:		
	INSURER F:		

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSTR. LTR.	TYPE OF INSURANCE	POLICY PERIOD (MM/DD/YYYY)	POLICY NUMBER	POLICY EFF. (MM/DD/YYYY)	POLICY EXPI. (MM/DD/YYYY)	LIMITS
	GENERAL LIABILITY					EACH OCCURRENCE \$
	<input type="checkbox"/> COMMERCIAL GENERAL LIABILITY					COVERAGES TO RENTED PREMISES (Per occurrence) \$
	<input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR					MED EXP (Any one person) \$
						PERSONAL & ADV INJURY \$
						GENERAL AGGREGATE \$
	GEN'L AGGREGATE LIMIT APPLIES PER:					PRODUCTS - COM/OP AGG \$
	<input type="checkbox"/> POLICY <input type="checkbox"/> PROJECT <input type="checkbox"/> LOC.					
	AUTOMOBILE LIABILITY					COMBINED SINGLE LIMIT (Per accident) \$
	<input type="checkbox"/> ANY AUTO					BODILY INJURY (Per person) \$
	<input type="checkbox"/> ALL OWNED AUTOS					BODILY INJURY (Per accident) \$
	<input type="checkbox"/> HIRED AUTOS					PROPERTY DAMAGE (Per accident) \$
	<input type="checkbox"/> SCHEDULED AUTOS					
	<input type="checkbox"/> NON-OWNED AUTOS					
	UMBRELLA LIAB					EACH OCCURRENCE \$
	<input type="checkbox"/> EXCESS LIAB					AGGREGATE \$
	<input type="checkbox"/> OCCUR					
	<input type="checkbox"/> CLAIMS-MADE					
	DED. RETENTIONS					
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY					WC STATUTORY LIMITS OTHER \$
	<input type="checkbox"/> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/OWNER EXCLUDED? (Mandatory in NH)					E.L. EACH ACCIDENT \$
	If yes, describe under DESCRIPTION OF OPERATIONS below					E.L. DISEASE - PER EMPLOYEE \$
						E.L. DISEASE - POLICY LIMIT \$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

CERTIFICATE HOLDER

CANCELLATION

Starr County
401 Britton Ave.
Rio Grande City, TX 78582

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

CONFLICT OF INTEREST QUESTIONNAIRE

For vendor doing business with local governmental entity

FORM CIQ

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 Name of vendor who has a business relationship with local governmental entity.

2 ☐ Check this box if you are filing an update to a previously filed questionnaire. (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 Name of local government officer about whom the information is being disclosed.

Name of Officer

4 Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

5 Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.

6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7

Signature of vendor doing business with the governmental entity

Date

CONFLICT OF INTEREST QUESTIONNAIRE

For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm>. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

- (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
- (B) a transaction conducted at a price and subject to terms available to the public; or
- (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

- (a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

- (2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds \$2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed;
or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than \$100 in the 12-month period preceding the date the officer becomes aware that:

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

- (a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

- (a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

- (1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

- (2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

HISTORICALLY UNDERUTILIZED BUSINESS (HUB) DECLARATION

The primary objective of the Starr County HUB Program is to ensure Historically Underutilized Businesses receive a fair and equal opportunity for participation in the County's procurement process. This fact holds true for Services (Professional & Non-Professional), Commodities, and Construction contracts and any subcontracts thereto. The program strongly encourages Prime Contractors to provide subcontracting opportunities to Certified Hub Contractors/Vendors. Our goal for HUB contractor/vendor participation, as well as HUB subcontractor participation is 30%. To be considered as a "Certified HUB Contractor/Vendor" the contractor/vendor must have been certified by, and hold a current and valid certification with any of the three agencies listed below.

Have you been Certified as a HUB or an MBE/WBE source?: ☐ Yes ☐ No

If yes, by whom?: ☐ Texas Building & Procurement Commission ☐ Other _____

Indicate Certification No(s): _____ or Are Certificate(s) Attached?: ☐ Yes ☐ No

LIST OF CERTIFIED HUB SUBCONTRACTORS

(Attach additional pages if necessary)

What percentage of the Bid, RFP, or RFQ is to be subcontracted with Certified HUB sources?: _____ %
(List HUB Subcontractor information below).

HUB Subcontractor Name: _____ HUB Status: _____
Certifying Agency (Check all applicable): ☐ Texas Building & Procurement Commission ☐ Other
Address: _____ City: _____ State: _____ Zip: _____
Contact Person: _____ Title: _____ Phone No.: ()
Subcontract Amount: \$ _____ Description of Work to be Performed: _____

HUB Subcontractor Name: _____ HUB Status: _____
Certifying Agency (Check all applicable): ☐ Texas Building & Procurement Commission ☐ Other
Address: _____ City: _____ State: _____ Zip: _____
Contact Person: _____ Title: _____ Phone No.: ()
Subcontract Amount: \$ _____ Description of Work to be Performed: _____

HUB Subcontractor Name: _____ HUB Status: _____
Certifying Agency (Check all applicable): ☐ Texas Building & Procurement Commission ☐ Other
Address: _____ City: _____ State: _____ Zip: _____
Contact Person: _____ Title: _____ Phone No.: ()
Subcontract Amount: \$ _____ Description of Work to be Performed: _____

**Certification
Regarding Debarment, Suspension and Ineligibility**

As is required by the Federal Regulations Implementing Executive Order 12549, Debarment and Suspension, 45 CFR Part 76, Government-wide Debarment and Suspension, the applicant certifies, to the best of his or her knowledge and belief, that both it and its principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency;
- b. Have not within a three-year period preceding this bid proposal and/or application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction, violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- c. Are not presently indicted for or otherwise criminally or civilly charged by a government entity with commission of any of the offenses enumerated herein; and
- d. Have not within a three-year period preceding this bid proposal and/or application had one or more public transactions terminated for cause or default.

Signature: _____
Print Name: _____
Title: _____
Telephone Number: _____
Date: _____

If the bidder is unable to certify to all of the statements in this Certification, such bidder should attach an explanation to this proposal.

APPENDIX A

THE TITLE VI CONTRACTOR ASSURANCES

During the performance of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor will comply with the Regulations relative to nondiscrimination in federally assisted programs of the United States Department of Transportation Federal Highway Administration, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Nondiscrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin, sex, age, disability, income or Limited English Proficiency in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and Acts and the Regulations relative to Non-discrimination on the grounds of race, color, national origin, sex, age, or disability.
4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the federal funding agency (FHWA or FTA) to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the Recipient or the Federal Funding Agency, as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Non-compliance:** In the event of the contractor's non-compliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the Federal Funding Agency may determine to be appropriate, including, but not limited to:
 - a. withholding contract payments to the contractor under the contract until the contractor complies; and/or
 - b. cancelling, terminating, or suspending a contract, in whole or in part.
6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Funding Agency may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with, litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX B
CLAUSES FOR DEEDS TRANSFERRING UNITED STATES PROPERTY

The following clauses will be included in deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein from the United States pursuant to the provisions of Assurance 4:

NOW, THEREFORE, the U.S. Department of Transportation as authorized by law and upon the condition that the **COUNTY OF STARR** will accept title to the lands and maintain the project constructed thereon in accordance with (Name of Appropriate Legislative Authority), the Regulations for the Administration of (Naming of Appropriate Program), and the policies and procedures prescribed by the (Federal Highway Administration) of the U.S. Department of Transportation in accordance and in compliance with all requirements imposed by Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S Department of Transportation pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. 2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the **COUNTY OF STARR** all the right, title and interest of the U.S. Department of Transportation in and to said lands described in Exhibit A attached hereto and made a part hereof.

(HABENDUM CLAUSE)

TO HAVE AND TO HOLD said lands and interests therein unto **COUNTY OF STARR** and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and will be binding on the **COUNTY OF STARR**, its successors and assigns.

The **COUNTY OF STARR**, in consideration of the conveyance of said lands and interests in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person will on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed [,] [and] * (2) that the **COUNTY OF STARR** will use the lands and interests in lands and interests in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations and Acts may be amended[, and (3) that in the event of breach of any of the above-mentioned non-discrimination conditions, the Department will have a right to enter or re-enter said lands and facilities on said land, and that above described land and facilities will thereon revert to and vest in and become the absolute property of the U.S. Department of Transportation and its assigns as such interest existed prior to this instruction]. *

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to make clear the purpose of Title VI.)

APPENDIX C
CLAUSES FOR TRANSFER OF REAL PROPERTY ACQUIRED OR IMPROVED UNDER THE
ACTIVITY, FACILITY, OR PROGRAM

The following clauses will be included in deeds, licenses, leases, permits, or similar instruments entered into by the **COUNTY OF STARR** pursuant to the provisions of Assurance 7(a):

- A. The (grantee, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add "as a covenant running with the land"] that:
 - 1. In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a U.S. Department of Transportation activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (grantee, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Acts and Regulations (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.
- B. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Non-discrimination covenants, **COUNTY OF STARR** will have the right to terminate the (lease, license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued.*
- C. With respect to a deed, in the event of breach of any of the above Non-discrimination covenants, the **COUNTY OF STARR** will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the **COUNTY OF STARR** and its assigns. *

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.

APPENDIX D
CLAUSES FOR CONSTRUCTION/USE/ACCESS TO REAL PROPERTY ACQUIRED UNDER
THE ACTIVITY, FACILITY OR PROGRAM

The following clauses will be included in deeds, licenses, permits, or similar instruments/agreements entered into by **COUNTY OF STARR** pursuant to the provisions of Assurance 7(b)”

- A. The (grantee, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, “as a covenant running with the land”) that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (grantee, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the List of discrimination Acts And Authorities.
- B. With respect to (licenses, leases, permits, etc.), in the event of breach of any of the above nondiscrimination covenants, **COUNTY OF STARR** will have the right to terminate the (license, permit, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued.*
- C. With respect to deeds, in the event of breach of any of the above nondiscrimination covenants, **COUNTY OF STARR** will there upon revert to and vest in and become the absolute property of **COUNTY OF STARR** and its assigns.*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

APPENDIX E

TITLE VI LIST OF PERTINENT NONDISCRIMINATION ACTS AND AUTHORITIES

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “Contractor”) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

Pertinent Nondiscrimination Authorities

- Title VI of the Civil Rights Act of 1964 (42 USC § 2000d *et seq.*, 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);
- 49 CFR part 21 (Non-discrimination in Federally-assisted programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964);
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 USC § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973 (29 USC § 794 *et seq.*), as amended (prohibits discrimination on the basis of disability); and 49 CFR part 27;
- The Age Discrimination Act of 1975, as amended (42 USC § 6101 *et seq.*) (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982 (49 USC § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 USC §§ 12131 – 12189) as implemented by U.S. Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration’s Nondiscrimination statute (49 USC § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 USC 1681 *et seq.*).

(IF APPLICABLE)

**2 C.F.R. § 200.327 & 2 C.F.R. PART 200, APPENDIX II,
REQUIRED CONTRACT CLAUSES FOR NON-FEDERAL
ENTITY CONTRACTS UNDER FEDERAL AWARDS**

2 C.F.R. § 200.327 & 2 C.F.R. PART 200, APPENDIX II, REQUIRED CONTRACT CLAUSES FOR NON-FEDERAL ENTITY CONTRACTS UNDER FEDERAL AWARDS

The United States Office of Management and Budget (OMB) issued in 2 C.F.R. 200: *Uniform Administrative Requirements, Cost Principles and Audit Requirements for Federal Awards* (Uniform Guidance). Subpart D: Post Federal Award Requirements: 2 CFR §§200.317-200.327 of the Uniform Guidance contain provisions applicable to procurements made with federal grant funding. [Except as otherwise provided, updated Post Federal Award Requirements (i.e.: 2 CFR §§200.317-200.327) apply to declarations and awards issued on or after November 12, 2020].

As a non-Federal entity, the County of Starr's ("County") contracts must contain the applicable contract clauses described in Appendix II to the Uniform Guidance (Contract Provisions for non-Federal Entity Contracts Under Federal Awards), which are set forth below. (2 C.F.R. §200.327). If applicable, the following clauses shall supersede any existing, similar clauses stated within the bid document, contract, and/or Terms and Conditions. *The term "Contractor" used herein refers to the proposer, bidder or other entity/individual responding to the applicable procurement packet.*

If applicable, the regulations in 2 CFR, Part 200 and Appendix II to the Uniform Guidance, as it may be amended from time to time, and the contract clauses below, are incorporated by reference as part of this procurement packet and any resulting agreement.

To procure goods and services using funds under a federal grant or contract, specific federal laws, regulations, and requirements may apply in addition to those under state law. The following provisions are required and apply when federal funds are expended by the County of Starr for any contract resulting from this procurement process.

1. Remedies.

- a. **Applicability.** This requirement applies to all Federal grant and cooperative agreement programs.
- b. **Standard.** Contracts for more than the simplified acquisition threshold currently set at \$150,000, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate. See 2 C.F.R. Part 200, Appendix II, ¶ A.
- c. **Statement.** Pursuant to Federal Rule (A) above, when federal funds are expended by the County, the County reserves all rights and privileges under the applicable laws and regulations with respect to this procurement in the event of breach of contract by either party. Contractor shall comply with all applicable Federal, State of Texas, and local laws, rules, and regulations and shall obtain all applicable licenses and permits for the conduct of its business and the performance of the services, and any provision of equipment and material ("Applicable Law"). All transactions related to any of the Contract Documents shall be governed by the laws of the State of Texas, and trial of any action brought in connection with the bid or the Contract Documents shall be held exclusively in a state court in the County of Starr, Texas.

2. Termination for Cause and Convenience.

- a. **Applicability.** This requirement applies to all Federal grant and cooperative agreement programs.
- b. **Standard.** All contracts in excess of \$10,000 shall address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement as follows. See 2 C.F.R. Part 200, Appendix II, ¶ B.
- c. **Statement.** *Termination.* County may terminate this Agreement for any reason upon ten (10) days written notice to the other party. County may terminate this Agreement immediately upon written notice if Contractor

breaches this Agreement. In the event of any termination, Contractor shall promptly deliver to the County any and all Work Materials prepared for the County prior to the effective date of such termination, all of which shall become County's sole property. After receipt of the Work Materials, County will pay Contractor for the services which the County determines were satisfactorily performed as of the effective date of the termination.

Excuses for Non-Performance. Either party shall be absolved from its obligations under this contract when and to the extent that performance is delayed or prevented (and in the County of Starr's case when and to the extent that its need for the articles, materials or work to be supplied hereunder is reduced or eliminated) by reason of acts of God, fire explosion, war riots, strikes, labor disputes, or governmental laws, orders or regulations.

Default. If Contractor or Subcontractor shall breach any provision hereof or shall become insolvent, enter voluntary or involuntary bankruptcy or receivership proceedings or make an assignment to the benefit of creditors, County of Starr shall have the right (without limiting any other rights or remedies which it may have hereunder or by operation of law) to terminate this contract by written notice to Contractor whereupon County shall be relieved of all further obligation hereunder except the obligation to pay the reasonable value of Contractor's prior performance (at not exceeding the contract rate), and Contractor shall be liable to County for all costs incurred by County in completing or procuring the completion of performance in excess of the contract price herein specified. The County's right to require strict performance of any obligation hereunder shall not be affected by any previous waiver, forbearance of course of dealing. Time is of the essence thereof.

3. **Equal Employment Opportunity.**

- a. **Applicability:** This requirement applies to all Federal grant and cooperative agreement programs.
- b. **Standard.** Except as otherwise provided under 41 C.F.R. Part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 C.F.R. § 60-1.3 must include the equal opportunity clause provided under 41 C.F.R. § 60- 1.4(b), in accordance with Executive Order 11246, *Equal Employment Opportunity* (30 Fed. Reg. 12319, 12935, 3 C.F.R. Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, *Amending Executive Order 11246 Relating to Equal Employment Opportunity*, and implementing regulations at 41 C.F.R. Part 60 (Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor). See 2 C.F.R. Part 200, Appendix II, ¶ C.
- c. **Key Definitions:**
 - (1) *Federally Assisted Construction Contract.* The regulation at 41 C.F.R. § 60-1.3 defines a "federally assisted construction contract" as any agreement or modification thereof between any applicant and a person for construction work which is paid for in whole or in part with funds obtained from the Government or borrowed on the credit of the Government pursuant to any Federal program involving a grant, contract, loan, insurance, or guarantee, or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance, or guarantee, or any application or modification thereof approved by the Government for a grant, contract, loan, insurance, or guarantee under which the applicant itself participates in the construction work.
 - (2) *Construction Work.* The regulation at 41 C.F.R. § 60-1.3 defines "construction work" as the construction, rehabilitation, alteration, conversion, extension, demolition or repair of buildings, highways, or other changes or improvements to real property, including facilities providing utility services. The term also includes the supervision, inspection, and other onsite functions incidental to the actual construction
- d. **Statement:** Contractor will comply with the Nondiscrimination Civil Rights Act of 1964, as amended and all Federal regulations relative to nondiscrimination in Federally assisted programs. The regulation at 41 C.F.R. Part 60-1.4(b) requires the insertion of the following contract clause:

“During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, 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 contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

(3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions as may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, That in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.”

4. Davis Bacon Act and Copeland Anti-Kickback Act.

- a. Applicability of Davis-Bacon Act. The Davis-Bacon Act only applies to the emergency Management Preparedness Grant Program, Homeland Security Grant Program, Nonprofit Security Grant Program, Tribal Homeland Security Grant Program, Port Security Grant Program, and Transit Security Grant Program. **It does not apply to other Federal grant and cooperative agreement programs, including the Public Assistance Program.**

- b. Standard. All prime construction contracts in excess of \$2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. §§ 3141-3144 and 3146-3148) as supplemented by Department of Labor regulations at 29 C.F.R. Part 5 (Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction)).

In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week.

The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

In contracts subject to the Davis-Bacon Act, the contracts must also include a provision for compliance with the Copeland “Anti-Kickback” Act (40 U.S.C. § 3145), as supplemented by Department of Labor regulations at 29 C.F.R. Part 3 (Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States). The Copeland Anti-Kickback Act provides that each contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to FEMA or applicable Federal entity. See 2 C.F.R. Part 200, Appendix II, ¶ D.

- c. Statement. The regulation at 29 C.F.R. § 5.5(a) does provide the required contract clause that applies to compliance with both the Davis-Bacon and Copeland Acts. However, as discussed in the previous subsection, the Davis-Bacon Act does not apply to Public Assistance recipients and subrecipients. In situations where the Davis-Bacon Act does not apply, neither does the Copeland “Anti-Kickback Act.” However, for purposes of grant programs where both clauses do apply, FEMA or applicable Federal entity requires the following contract clause:

“Compliance with the Copeland “Anti-Kickback” Act.

(1) *Contractor.* The contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.

(2) *Subcontracts.* The contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as Federal requirements may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.

(3) *Breach.* A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.”

5. Contract Work Hours and Safety Standards Act.

- a. Applicability: This requirement applies to all Federal grant and cooperative agreement programs.
- b. Standard. Where applicable (see 40 U.S.C. § 3701), all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. §§ 3702 and 3704, as supplemented by Department of Labor regulations at 29 C.F.R. Part 5.

Under 40 U.S.C. § 3702, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week.

The requirements of 40 U.S.C. § 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence. See 2 C.F.R. Part 200, Appendix II, ¶ E.

The regulation at 29 C.F.R. § 5.5(b) provides the required contract clause concerning compliance with the Contract Work Hours and Safety Standards Act:

c. Statement.

“Compliance with the Contract Work Hours and Safety Standards Act.

(1) *Overtime requirements.* No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) *Violation; liability for unpaid wages; liquidated damages.* In the event of any violation of the clause set forth in paragraph (1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

(3) *Withholding for unpaid wages and liquidated damages.* The County of Starr shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

(4) *Subcontracts.* The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.”

6. Rights to Inventions Made Under a Contract or Agreement.

- a. Applicability: Stafford Act Disaster Grants. This requirement **does not apply to the Public Assistance, Hazard Mitigation Grant Program, Fire Management Assistance Grant Program, Crisis Counseling Assistance and Training Grant Program, Disaster Case Management Grant Program, and Federal Assistance**

to Individuals and Households – Other Needs Assistance Grant Program, as FEMA or Federal awards under these programs do not meet the definition of “funding agreement.”

- b. Standard. If the FEMA or Federal award meets the definition of “funding agreement” under 37 C.F.R. § 401.2(a) and the non-Federal entity wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that “funding agreement,” the non-Federal entity must comply with the requirements of 37 C.F.R. Part 401 (Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements), and any implementing regulations issued by FEMA or applicable awarding agency. See 2 C.F.R. Part 200, Appendix II, ¶ F.
- c. Key Definition: The regulation at 37 C.F.R. § 401.2(a) currently defines “funding agreement” as any contract, grant, or cooperative agreement entered into between any Federal agency, other than the Tennessee Valley Authority, and any contractor for the performance of experimental, developmental, or research work funded in whole or in part by the Federal government. This term also includes any assignment, substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under a funding agreement as defined in the first sentence of this paragraph.

7. Clean Air Act and the Federal Water Pollution Control Act.

- a. Applicability and Standard: Contracts of amounts in excess of \$150,000 must contain a provision that requires the contractor to agree to comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act (42 U.S.C. §§ 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. §§ 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency. See 2 C.F.R. Part 200, Appendix II, ¶ G.
- b. Statement: Included in contracts as provided in section “7a” above.
 - (1) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq. and the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.
 - (2) The contractor agrees to report each violation to the Federal awarding agency (e.g. Federal Emergency Management Agency-FEMA) and the Regional Office of the Environmental Protection Agency. Contractor understands and agrees that each violation reported to the County of Starr will, in turn, be reported as required to assure notification to the Federal awarding agency and the appropriate Environmental Protection Agency Regional Office.
 - (3) The contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by the applicable Federal awarding agency (e.g. FEMA).

8. Debarment and Suspension.

- a. Applicability: This requirement applies to all Federal grant and cooperative agreement programs.
- b. Standard. Non-Federal entities and contractors are subject to the debarment and suspension regulations implementing Executive Order 12549, *Debarment and Suspension* (1986) and Executive Order 12689, *Debarment and Suspension* (1989) at 2 C.F.R. Part 180 and the Department of Homeland Security’s regulations at 2 C.F.R. Part 3000 (Nonprocurement Debarment and Suspension). These regulations restrict awards, subawards, and contracts with certain parties that are debarred, suspended, or otherwise excluded from or ineligible for participation in Federal assistance programs and activities. See 2 C.F.R. Part 200, Appendix II, ¶ H; and Chapter IV, ¶ 6.d and Appendix C, ¶ 2. A contract award must not be made to parties listed in the SAM Exclusions. SAM Exclusions is the list maintained by the General

Services Administration that contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549. SAM exclusions can be accessed at www.sam.gov. See 2 C.F.R. § 180.530; Chapter IV, ¶ 6.d and Appendix C, ¶ 2.

In general, an “excluded” party cannot receive a Federal grant award or a contract within the meaning of a “covered transaction,” to include subawards and subcontracts. This includes parties that receive Federal funding indirectly, such as contractors to recipients and subrecipients. The key to the exclusion is whether there is a “covered transaction,” which is any nonprocurement transaction (unless excepted) at either a “primary” or “secondary” tier. Although “covered transactions” do not include contracts awarded by the Federal Government for purposes of the nonprocurement common rule and DHS’s implementing regulations, it does include some contracts awarded by recipients and subrecipient.

Specifically, a covered transaction includes the following contracts for goods or services:

- (1) The contract is awarded by a recipient or subrecipient in the amount of at least \$25,000.
- (2) The contract requires the approval of FEMA or applicable Federal entity, regardless of amount.
- (3) The contract is for Federally-required audit services.
- (4) A subcontract is also a covered transaction if it is awarded by the contractor of a recipient or subrecipient and requires either the approval of FEMA or applicable Federal entity or is in excess of \$25,000.

- c. Statement. The following provides a debarment and suspension clause. It incorporates a method of verifying that contractors are not excluded or disqualified:

For maximum protection, provide a print or electronic document for every prime and subcontractor, from www.sam.gov in order to ensure that they are not debarred, suspended, or otherwise excluded from or ineligible for participation in Federal assistance programs and activities.

This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such the contractor is required to verify that none of the contractor, its principals (defined at 2 C.F.R. § 180.995), or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

The contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

This certification is a material representation of fact relied upon by (insert name of subrecipient). If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to (name of entity serving as recipient and name of subrecipient), the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.”

9. Byrd Anti-Lobbying Amendment.

- a. Applicability: This requirement applies to all Federal grant and cooperative agreement programs.
- b. Standard. Contractors that apply or bid for an award of \$100,000 or more must file the required certification. See 2 C.F.R. Part 200, Appendix II, ¶ I; 44 C.F.R. Part 18; Chapter IV, 6.c; Appendix C, ¶ 4. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or

organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. § 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award. See Chapter IV, ¶ 6.c and Appendix C, ¶ 4.

- c. Statement. The following statement in bold provides a Byrd Anti-Lobbying contract clause:

(IF APPLICABLE, PLEASE FILL IN BLANKS AND SIGN)

“Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352 (as amended)

Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient.”

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

(To be submitted with each bid or offer exceeding \$100,000)

The undersigned Contractor, _____ certifies, to the best of his or her knowledge, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form- LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying

Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 *et seq.*, apply to this certification and disclosure, if any.

Signature of Contractor's Authorized Official

Name and Title of Contractor's Authorized Official

Date

10. **Procurement of Recovered Materials.**

- a. **Applicability:** This requirement applies to all Federal grant and cooperative agreement programs.
- b. **Standard.** A non-Federal entity that is a **state agency or agency of a political subdivision** of a state and its contractors must comply with Section 6002 of the Solid Waste Disposal Act, Pub. L. No. 89-272 (1965) (codified as amended by the Resource Conservation and Recovery Act at 42 U.S.C. § 6962). See 2 C.F.R. Part 200, Appendix II, ¶ J; 2 C.F.R. § 200.323; *PDAT Supplement*, Chapter V, ¶ 7.

The requirements of Section 6002 include procuring only items designated in guidelines of the EPA at 40 C.F.R. Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired by the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

- c. **Statement.** The following provides the clause that a state agency or agency of a political subdivision of a state and its contractors can include in contracts meeting the above contract thresholds:

“(1) In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA- designated items unless the product cannot be acquired—

- (i) Competitively within a timeframe providing for compliance with the contract performance schedule;
 - (ii) Meeting contract performance requirements; or
 - (iii) At a reasonable price.
- (2) Information about this requirement, along with the list of EPA-designate items, is available at EPA's Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.
- (3) The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.”

11. **Prohibition on Contracting for Covered Telecommunications Equipment or Services – 2 CFR § 200.216 (FEMA Interim Policy #405-143-1 effective August 13, 2020).**

- a. **Applicability:** This requirement applies to all Federal grant and cooperative agreement programs and/or as provided below, and is effective August 13, 2020.

- b. Standard. A non-Federal entity is prohibited against using federal funds to purchase telecommunications and video surveillance equipment and services (such as but not limited to mobile phones, land lines, internet, video surveillance, and cloud servers) from certain companies/entities in covered foreign countries for national security reasons. This regulation is being incorporated into federal grants and contracts received by the County through 2 CFR 200.216 and/or Federal Acquisition Regulations (FAR) clause 52.204-25; as well as guidance provided through Federal Emergency Management Agency (FEMA) Policy #405-143-1. See 2 C.F.R. Part 200, Appendix II, ¶ K

Currently, applicable federal provisions provide that Covered Foreign country means the People's Republic of China and covered telecommunications equipment or services means –

- i. Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation, (or any subsidiary or affiliate of such entities);
- ii. For the purpose of public safety, security of Government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities);
- iii. Telecommunications or video surveillance services provided by such entities or using such equipment; or
- iv. Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

The definition of “Affiliate” can be found in FAR 2.101. Listing of subsidiaries and affiliates can be found in Supplement Number 4 to 15 CFR Part 744.

- c. Statement. Federal awards recipients and subrecipients, as well as their contractors and subcontractors, include the following required contract clause in applicable new, extended, or renewed contracts and subcontracts as per the provisions discussed above.

PROHIBITION ON CONTRACTING FOR COVERED TELECOMMUNICATIONS EQUIPMENT OR SERVICES

- (a) Definitions. As used in this clause, the terms backhaul; covered foreign country; covered telecommunications equipment or services; interconnection arrangements; roaming; substantial or essential component; and telecommunications equipment or services have the meaning as defined in FEMA Policy, #405-143-1 Prohibitions on Expending FEMA Award Funds for Covered Telecommunications Equipment or Services As used in this clause—
- (b) Prohibitions.
 - (1) Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of an executive agency on or after Aug.13, 2020, from obligating or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons.
 - (2) Unless an exception in paragraph (c) of this clause applies, the contractor and its subcontractors may not use grant, cooperative agreement, loan, or loan guarantee funds from the Federal Emergency Management Agency to:

- (i) Procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;
 - (ii) Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;
 - (iii) Enter into, extend, or renew contracts with entities that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system; or
 - (iv) Provide, as part of its performance of this contract, subcontract, or other contractual instrument, any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.
- (c) Exceptions.
 - (1) This clause does not prohibit contractors from providing—
 - a. A service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or
 - b. Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.
 - (2) By necessary implication and regulation, the prohibitions also do not apply to:
 - a. Covered telecommunications equipment or services that:
 - i. Are not used as a substantial or essential component of any system; and
 - ii. Are not used as critical technology of any system.
 - b. Other telecommunications equipment or services that are not considered covered telecommunications equipment or services.
- (d) Reporting requirement.
 - (1) In the event the contractor identifies covered telecommunications equipment or services used as a substantial or essential component of any system, or as critical technology as part of any system, during contract performance, or the contractor is notified of such by a subcontractor at any tier or by any other source, the contractor shall report the information in paragraph (d)(2) of this clause to the recipient or subrecipient, unless elsewhere in this contract are established procedures for reporting the information.
 - (2) The Contractor shall report the following information pursuant to paragraph (d)(1) of this clause:
 - (i) Within one business day from the date of such identification or notification: The contract number; the order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.

- (ii) Within 10 business days of submitting the information in paragraph (d)(2)(i) of this clause: Any further available information about mitigation actions undertaken or recommended. In addition, the contractor shall describe the efforts it undertook to prevent use or submission of covered telecommunications equipment or services, and any additional efforts that will be incorporated to prevent future use or submission of covered telecommunications equipment or services.
- (e) Subcontracts. The Contractor shall insert the substance of this clause, including this paragraph (e), in all subcontracts and other contractual instruments.

12. **Domestic Preferences for Procurements**

- a. **Applicability:** This requirement of this section must be included in all subawards including all contracts and purchase orders for work or products under Federal award applies to all contracts and purchase orders for work or products using federal funds.
- b. **Standard.** As appropriate, and to the extent consistent with law, Non Federal Entities should, to the greatest extent practicable under a federal award, provide a preference for the purchase, acquisition, or use of goods, products or materials produced in the United States. This includes, but is not limited to, iron, aluminum, steel, cement, and other manufactured products. See 2 C.F.R. Part 200.322 and 2 C.F.R. Part 200, Appendix II, ¶ L
- c. **Statement.** The following provides the required Domestic Preferences for Procurements contracts clause that is incorporated herein by reference.

“Domestic Preference for Procurements

As appropriate, and to the extent consistent with law, the contractor should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States. This includes, but is not limited to iron, aluminum, steel, cement, and other manufactured products.

For purposes of this clause:

- *Produced in the United States* means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
- *Manufactured products* mean items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.”

Contractor agrees to comply with all federal, state and local laws, rules, regulations and ordinances, as applicable. It is further acknowledged that the Contractor read and understands all provisions, laws, acts, regulations, etc. as specifically noted above and certifies compliance with the same.

Vendor's Name/Company Name: _____

Printed Name and Title of Authorized Representative: _____

Signature of Authorized Representative: _____

Date: _____

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Non-segregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
- XI. Certification Regarding Use of Contract Funds for Lobbying
- XII. Use of United States-Flag Vessels:

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). 23 CFR 633.102(e).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. 23 CFR 633.102(e).

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services) in accordance with 23 CFR 633.102. The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract). 23 CFR 633.102(b).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work

performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal Employment Opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (see 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140, shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract. 23 CFR 230.409 (g)(4) & (5).

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, sexual orientation, gender identity, color, national origin, age or disability. Such action shall include: 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, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action or are substantially involved in such action, will be made fully cognizant of and will implement the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action

within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs (i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance). In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 23 CFR 230.409. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide

sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants /

Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established thereunder. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:

The contractor shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors, suppliers, and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women.

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of more than \$10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, the contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location under the contractor's control where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway

Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding (29 CFR 5.5)

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics,

including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records (29 CFR 5.5)

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or

subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees (29 CFR 5.5)

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State

Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the

corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor

set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility (29 CFR 5.5)

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. 29 CFR 5.5.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph 1 of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph 1 of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1 of this section. 29 CFR 5.5.

* \$27 as of January 23, 2019 (See 84 FR 213-01, 218) as may be adjusted annually by the Department of Labor; pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990).

3. Withholding for unpaid wages and liquidated damages.

The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 of this section. 29 CFR 5.5.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs 1 through 4 of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1 through 4 of this section. 29 CFR 5.5.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or

equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance

with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of \$150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.326.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders

or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.326.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant

who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;.

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

3. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is

submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contractor). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(a) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(b) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(c) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier

subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.
2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B)**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

"General Decision Number: TX20250221 01/03/2025

Superseded General Decision Number: TX20240221

State: Texas

Construction Type: Building

Counties: Starr, Uvalde, Willacy, Zapata and Zavala Counties
in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family
homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally
required to pay at least the applicable minimum wage rate
required under Executive Order 14026 or Executive Order 13658.

Please note that these Executive Orders apply to covered
contracts entered into by the federal government that are
subject to the Davis-Bacon Act itself, but do not apply to
contracts subject only to the Davis-Bacon Related Acts,
including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered |. Executive Order 14026 |
into on or after January 30, | generally applies to the |
2022, or the contract is | contract. |
renewed or extended (e.g., an |. The contractor must pay |

option is exercised) on or	all covered workers at
after January 30, 2022:	least \$17.75 per hour (or
	the applicable wage rate
	listed on this wage
	determination, if it is
	higher) for all hours
	spent performing on the
	contract in 2025.
_____	_____
If the contract was awarded on	. Executive Order 13658
or between January 1, 2015 and	generally applies to the
January 29, 2022, and the	contract.
contract is not renewed or	. The contractor must pay all
extended on or after January	covered workers at least
30, 2022:	\$13.30 per hour (or the
	applicable wage rate listed
	on this wage determination,
	if it is higher) for all
	hours spent performing on
	that contract in 2025.
_____	_____

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker
protections under the Executive Orders is available at
<http://www.dol.gov/whd/govcontracts>.

Modification Number Publication Date

0 01/03/2025

ASBE0087-002 06/03/2024

Rates Fringes

ASBESTOS WORKER/HEAT & FROST

INSULATOR.....\$ 29.50 8.79

BOIL0074-003 07/01/2023

Rates Fringes

BOILERMAKER.....\$ 37.00 24.64

IRON0066-005 06/01/2024

Rates Fringes

IRONWORKER, REINFORCING AND

STRUCTURAL.....\$ 26.75 7.53

LABO0154-001 05/01/2024

Rates Fringes

Laborers: (Mason Tender -

Cement/Concrete).....\$ 25.27 9.57

SUTX2009-108 04/20/2009

Rates Fringes

BRICKLAYER.....\$ 17.76 0.00

CARPENTER.....\$ 18.00 0.00

CEMENT MASON/CONCRETE FINISHER...\$ 13.27 ** 0.00

ELECTRICIAN.....\$ 15.85 ** 0.00

LABORER: Common or General.....\$ 8.50 ** 0.00

LABORER: Landscape &

Irrigation.....\$ 8.50 ** 0.22

LABORER: Mason Tender - Brick...\$ 12.02 ** 0.00

LABORER: Mortar Mixer.....\$ 9.50 ** 0.00

OPERATOR:

Backhoe/Excavator/Trackhoe.....\$ 13.75 ** 0.00

OPERATOR: Bulldozer.....\$ 12.80 ** 0.43

OPERATOR: Crane.....\$ 21.33 0.00

OPERATOR: Forklift.....\$ 14.58 ** 0.00

OPERATOR: Loader (Front End)....\$ 10.54 ** 0.00

PAINTER: Brush, Roller and
Spray.....\$ 15.80 ** 0.00

PLUMBER, Includes HVAC Pipe
Installation.....\$ 12.50 ** 0.00

ROOFER.....\$ 15.10 ** 1.29

SHEET METAL WORKER.....\$ 17.00 ** 0.00

TILE SETTER.....\$ 15.00 ** 0.00

TRUCK DRIVER.....\$ 11.24 ** 0.35

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.75) or 13658 (\$13.30). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year.

Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within

the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example:

PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated

rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE:

UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio.

The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates

reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were

adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

- a) a survey underlying a wage determination
- b) an existing published wage determination
- c) an initial WHD letter setting forth a position on a wage determination matter
- d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be

directed to the WHD Branch of Construction Wage Determinations.
Requests can be submitted via email to BCWD-Office@dol.gov or
by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative

Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210.

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END OF GENERAL DECISION"

PROPOSER'S AFFIDAVIT

PROPOSER'S AFFIDAVIT OF NON-COLLUSION, NON-CONFLICT OF INTEREST, AND ANTI-LOBBYING

STATE OF TEXAS
COUNTY OF STARR

Affiant, _____, being first duly sworn, deposes that:

(1) Affiant does hereby state neither the proposer nor any of the proposer's officers, partners, owners, agents, representatives, employees, or parties in interest, has in any way colluded, conspired, agreed, directly or indirectly with any person, firm, corporation, or another proposer, or potential proposer, to provide any money or other valuable consideration for assistance in procuring or attempting to procure a contract or fix the prices in the attached proposed or the proposal of any other proposer, and further states that no such money or another reward will be hereinafter paid.

(2) Affiant further states they have neither recommended nor suggested to Starr County or any of its officials or employees, any of the terms or provisions set forth in their Request for Proposal and subsequent agreement, except at a meeting open to all interested proposers, of which proper notice was given.

(3) Affiant, further states their officers, employees, or agents have not, and will not attempt to lobby, directly or indirectly, the Starr County Commissioner's Court between proposal submission date and award by the Starr County Commissioner's Court.

(4) Affiant further states no officer, or stockholder of the proposer is a member of the staff, or related to any employee of Starr County except as noted herein below:

Signature/Title: _____

Subscribed and sworn to before me this _____ day of _____, 20____.

Notary Public

My commission expires: _____, 20____

SECTION 00 73 43 — WAGE RATE REQUIREMENTS

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 GENERAL NOTES

- A. **Do not dimension the drawings. Any dimensions, questions, should be directed to the Architect or Engineer.**
- B. Contractor shall protect all streets and sidewalks and shall make all necessary repairs at his own expense.
- C. Shall at all times protect the excavations, trenches, and/or the building from damage from rain water, ground water, backing up drains or sewers and all other water. He shall provide all pumps and equipment and enclosures to provide this protection.
- D. Contractor shall provide all shoring, bracing and sheathing as required for safety and proper execution of the work and remove same when work is completed. Contractor shall be responsible for all scaffolding, shoring, bracing, sheathing, temporary construction and temporary walkways, etc., and shall hold harmless the Owner and Architect from any injury or litigation as a result of causes related to any scaffolding, shoring, bracing, sheathing, temporary construction and temporary walkways.
- E. Contractor shall comply with the Trench Safety Law Requirements.

1.3 WAIVER OF LIEN:

- A. A. In submitting a Bid, Contractor, if awarded the Contract, explicitly warrants that the Owner shall be held free of any claim or lien of any nature resulting from Contractor's pursuance or prosecution of the work. This shall cover any third party lien in any manner whatsoever concerning Contractor's performance or payment on this project.

1.4 PREVAILING WAGES:

- A. A. Article 5159a, Vernon's Annotated Texas Civil Statutes as below noted apply to this project.

B. “Not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the work is performed, and not less than the general per diem wages for legal holiday and overtime work, shall be paid to all laborers, workmen and mechanics employed by or on behalf of the State of Texas, or by or on behalf of any county, district or other political subdivision of the State, engaged in the construction of public works, exclusive of maintenance work”.

C. As a federally funded project, it shall follow the provisions of the Davis Bacon Act as shown below:

"General Decision Number: TX20250221 01/03/2025

Superseded General Decision Number: TX20240221

State: Texas

Construction Type: Building

Counties: Starr, Uvalde, Willacy, Zapata and Zavala Counties in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract.	
	. The contractor must pay all covered workers at least \$17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.	
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract.	
	. The contractor must pay all covered workers at least \$13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.	

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number Publication Date
0 01/03/2025

ASBE0087-002 06/03/2024

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR.....	\$ 29.50	8.79

BOIL0074-003 07/01/2023

	Rates	Fringes
BOILERMAKER.....	\$ 37.00	24.64

IRON0066-005 06/01/2024

	Rates	Fringes
IRONWORKER, REINFORCING AND STRUCTURAL.....	\$ 26.75	7.53

LABO0154-001 05/01/2024

	Rates	Fringes
Laborers: (Mason Tender - Cement/Concrete).....	\$ 25.27	9.57

SUTX2009-108 04/20/2009

	Rates	Fringes
BRICKLAYER.....	\$ 17.76	0.00
CARPENTER.....	\$ 18.00	0.00
CEMENT MASON/CONCRETE FINISHER...	\$ 13.27 **	0.00
ELECTRICIAN.....	\$ 15.85 **	0.00
LABORER: Common or General.....	\$ 8.50 **	0.00
LABORER: Landscape & Irrigation.....	\$ 8.50 **	0.22

LABORER: Mason Tender - Brick...	\$ 12.02 **	0.00
LABORER: Mortar Mixer.....	\$ 9.50 **	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 13.75 **	0.00
OPERATOR: Bulldozer.....	\$ 12.80 **	0.43
OPERATOR: Crane.....	\$ 21.33	0.00
OPERATOR: Forklift.....	\$ 14.58 **	0.00
OPERATOR: Loader (Front End)....	\$ 10.54 **	0.00
PAINTER: Brush, Roller and Spray.....	\$ 15.80 **	0.00
PLUMBER, Includes HVAC Pipe Installation.....	\$ 12.50 **	0.00
ROOFER.....	\$ 15.10 **	1.29
SHEET METAL WORKER.....	\$ 17.00 **	0.00
TILE SETTER.....	\$ 15.00 **	0.00
TRUCK DRIVER.....	\$ 11.24 **	0.35

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.75) or 13658 (\$13.30). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information

on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union

rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

----- WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

- a) a survey underlying a wage determination
- b) an existing published wage determination
- c) an initial WHD letter setting forth a position on a wage determination matter
- d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as

conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed. With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

- 2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

- 3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

- 4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

1.5 CONTRACTOR'S ASBESTOS FREE AFFIDAVIT:

- A. A. In order to protect staff, employees and public in general from any unnecessary exposure to asbestos fibers, the Asbestos Hazard Emergency Response Act prohibits the use of asbestos containing materials in all forms in the construction and operation of this facility.
- B. Failure to complete this waiver constitutes non-compliance with the job specifications. This document shall be attached to the Contract between Owner and Contractor.

1.6 AFFIDAVIT:

- A. I, certify that I am familiar with the materials used in the construction of, and incorporated into, the construction described below. I further certify that to the best of my knowledge and belief no asbestos containing materials, either friable or otherwise were used in the process of constructing or incorporated into the construction.

B. The undersigned, being duly sworn upon his/her oath deposes and says that he/she is the person making the foregoing statements and that they are made in good faith and are true in every respect.

C. Contractor's signature:

STATE OF

COUNTY OF

D. I, _____, a Notary Public in and for said County, in the State aforesaid, DO THEREBY CERTIFY THAT _____, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person, and acknowledge that he/she signed, sealed, and delivered said instrument as his/her free and voluntary act, for the uses and purposes herein set forth.

GIVEN UNDER MY HAND AND NOTARIAL SEAL THIS
, DATE OF , 20

NOTARY PUBLIC: ,

MY COMMISSION EXPIRES: ,

(NOTARY SEAL)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 11 00 - SUMMARY

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 SUMMARY OF WORK

- A. Project Identification: As follows:
 - 1. Project: Starr County Juvenile Detention Center Upgrades
 - 2. Owner: The County of Starr
 - 3. Location: 401 Britton Ave. Rio Grande City, TX
- B. Contract Documents, dated February 5, 2025 were prepared by Milnet Architectural Services, 608 S. 12th St. McAllen, TX. 78501.
- C. The Work consists of security systems upgrades (cell door hardware/reinforcement/replacement, intercoms, surveillance, access control), plumbing upgrades, lighting upgrades, light demo/remodel, and minor exterior upgrades.

1.3 WORK RESTRICTIONS

- A. Contractor's Use of Premises: During construction, Contractor shall have **limited** use of **site** indicated. Contractor's use of premises is limited only by Owner's right to perform work or employ other contractors on portions of Project.
- B. Assume full responsibility for the protection and safekeeping of Products under this Contract, stored on the site.
- C. Move any stored Products, under Contractor's control, which interfere with operations of the Owner and separate contractor.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 UNIT PRICES

- A. Changes to the Work incorporating Unit Prices will be made by Change Order.

1.3 CONTRACT MODIFICATION PROCEDURES

- A. On Owner's approval of a proposal from Contractor, Architect will issue a Change Order on AIA Document G701, for all changes to Contract Sum or Contract Time.
- B. When Owner and Contractor disagree on the terms of a proposal, Architect may issue a Construction Change Directive on AIA Document G714, instructing Contractor to proceed with the change. Construction Change Directive will contain a description of the change and designate the method to be followed to determine changes to Contract Sum or Contract Time.

1.4 PAYMENT PROCEDURES

- A. Submit a Schedule of Values **at least 10 days before** the first Application for Payment. In Schedule of Values, break down Contract Sum into at least one line item for each Specification Section, showing both material and labor. Correlate the Schedule of Values with Contractor's Construction Schedule.
- B. Submit 3 copies of each application for payment on AIA Document G702/703, according to the schedule established in Owner/Contractor Agreement.
 - 1. For the second Application for Payment through the Application for Payment submitted at Substantial Completion, submit partial releases of liens from each subcontractor or supplier for whom amounts were requisitioned in the previous Application for Payment.
 - 2. Contractor shall submit along with each Application for Payment, any proposed delay days, rain/weather days, additional general conditions incurred and an updated construction schedule.
 - 3. The Architect will not review or consider approval of any proposed delay days or additional general conditions incurred that are not submitted within **ten (10) calendar days** of said event(s) taking place.

4. Submit final Application for Payment after completion of Project closeout procedures with release of liens and supporting documentation. Include consent of surety to final payment and insurance certificates.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 21 00 — ALLOWANCES

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 RELATED DOCUMENTS

- A. Section 01 20 00 – Price and Payment Procedures.

1.3 CONTINGENCY ALLOWANCE

- A. Include in the Contract, a stipulated sum of **Sixty-Seven Thousand, One Hundred Nineteen Dollars, (\$67,119.00)** for use upon Architect's instruction.

1.4 PROCEDURES FOR MANAGING ALLOWANCES

- A. Contractor's direct costs for Products, delivery, installation, labor, bonding, and equipment rental will be included in Construction Change Directives authorizing expenditure of funds from Allowances.
- B. Funds will be drawn from Allowances only by Construction Change Directives. Additional markups for overhead, profit, and other fees will not be allowed.
- C. At closeout of Contract, funds remaining in Allowances will be credited to Owner by Change Order.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 25 00 – SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 SUBSTITUTION REQUIREMENTS

- A. When material, article, or method is specified using name of proprietary product manufacturer, vendor, or method followed by phrase "or equal," specific item mentioned establishes basis upon which projects are to be built.
 - 1. Other manufacturers' materials, articles, and methods not named will be considered as substitutions provided required information is submitted on "SUBSTITUTION REQUEST FORM" and will not require substantial revisions of Contract Documents.
 - 2. This applies to specific construction methods when required by Contract Documents.
 - 3. Substitution Requests must be filled out on enclosed "Substitution Request Form".
- B. Whenever material, article, or method is specified or described without phrase "or equal," no substitutions will be allowed.
- C. Costs for redesigns due to substituted items are responsibility of Applicant.
- D. In making request for substitution, Applicant/Contractor represents that he:
 - 1. Has personally investigated proposed product or method and determined that it is equal in all respects to that specified.
 - 2. Will provide same guarantee for substitution as for product or method specified.
 - 3. Will coordinate installation of accepted substitution into work, making design and construction changes to complete work in all respects following the Contract Documents.

1.3 SUBMITTAL OF DATA FOR PROPOSED SUBSTITUTIONS

- A. In order for substitutions that do not change design intent to be considered, submit **no later than 8 days** prior to bid date deadline, 3 copies of complete data set forth herein to permit complete analysis of proposed substitutions listed on submitted "SUBSTITUTION REQUEST FORM".
 - 1. For Products:

- a. Identification including manufacturer's name and address.
 - b. Manufacturer's literature, including but not necessarily limited to:
 - 1) Product description, performance, and test data.
 - 2) Reference standards.
 - c. Samples where appropriate.
 - d. Name and address of similar projects on which product was used and dates of installation with contact name and telephone number.
- 2. For Construction Methods:
 - a. Detailed description of proposed method.
 - b. Drawings illustrating methods.
 - c. Name and address of similar projects on which method was used and dates of use with contact name and telephone number.
- 3. Comparison of proposed substitution with product or method specified
- 4. Data relating to impact on construction schedule by proposed substitution.
- 5. Impact on other contracts.

1.4 APPROVAL OF SUBSTITUTION

- A. Architect's decision regarding evaluation of substitutions will be final and binding.
- B. All approved substitutions will be incorporated into the Contract Documents by Addendum.

PART 2 - PRODUCTS
NOT USED

PART 3 - EXECUTION
NOT USED

SUBSTITUTION REQUEST FORM

Project: _____ Substitution Request Number: _____

From: _____
To: _____ Date: _____

A/E Project Number: _____
Re: _____ Contract For: _____

Specification Title: _____ Description: _____
Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____
Manufacturer: _____ Address: _____ Phone: _____
Trade Name: _____ Model No.: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: _____
Signed by: _____
Firm: _____
Address: _____

Telephone: _____

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: _____

Date: _____

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

END OF SECTION

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 PROJECT MANAGEMENT AND COORDINATION

- A. Verify layout information shown on Drawings, in relation to property survey and existing benchmarks, before laying out the Work.
- B. Coordinate construction to ensure efficient and orderly execution of each part of the Work.
- C. Progress meetings will be held at Project site every two weeks. Notify Owner and Architect of meeting dates. Each subcontractor or other entity concerned with current progress or involved with planning or coordination of future activities, shall attend. The Contractor shall:
 - 1. Prepare a progress meeting agenda.**
 - 2. Prepare a sign in sheet for each progress meeting.**
 - 3. Prepare minutes of each meeting and distribute to parties present.**

1.3 CONSTRUCTION SCHEDULE

- A. Prepare a horizontal bar-chart construction schedule. Provide a separate time bar for each activity and a vertical line to identify the first workday of each week. Use same breakdown of Work indicated in the Schedule of Values. As Work progresses, mark each bar to indicate actual completion.
 - 1. Submit within twenty (20) days after date established for Commencement of the Work.
 - 2. Coordinate each element with other activities. Show each activity in proper sequence. Indicate sequences necessary for completion of related Work.
 - 3. Indicate Substantial Completion and allow time for Architect's procedures necessary for certifying Substantial Completion.
 - 4. Schedule Distribution: Distribute copies to Owner, Architect, subcontractors, and parties required to comply with dates.

5. Updating: Revise the schedule after each meeting or activity where revisions have been made. Distribute revised copies to Owner, Architect, subcontractors, and parties required to comply with dates.

1.4 SUBMITTAL PROCEDURES

- A. Coordinate submittal preparation with construction schedule, fabrication lead-times, other submittals, and activities that require sequential operations.
 1. No extension of Contract Time will be authorized due to failure to transmit submittals in time to permit processing sufficiently in advance of when materials are required in the Work.
 2. Architect will not accept submittals from sources other than Contractor.
- B. Prepare submittals by placing a permanent label on each for identification. Provide a 4 by 5 inch space on the label or beside title block to record review and approval markings and action taken. Include the following information on the label:
 1. Project name.
 2. Date.
 3. Name and address of Contractor.
 4. Name and address of subcontractor or supplier.
 5. Number and title of appropriate Specification Section.
 6. Contractor's certification that materials comply with specified requirements.
- C. Coordinate each submittal with other submittals and with work that does not require submittals.
- D. Product Data: Mark each copy to show applicable choices and options. Include the following:
 1. Data indicating compliance with specified standards and requirements.
 2. Notation of coordination requirements.
 3. For equipment data, include rated capacities, dimensions, weights, required clearances, and furnished specialties and accessories.
- E. Shop Drawings: Submit newly prepared information drawn to scale. Do not reproduce Contract Documents or copy standard information. Submit 1 reproducible print and 1 blue- or black-line print on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches. Architect will return the reproducible print. Include the following:
 1. Dimensions, profiles, methods of attachment, coordination with adjoining work, large scale details, and other information, as appropriate for the Work.
 2. Identification of products and materials.
 3. Notation of coordination requirements.
 4. Notation of dimensions established by field measurement.
 5. Identification of deviations from Contract Documents.
- F. Samples: Submit Samples finished as specified and identical with the material proposed. Where variations are inherent in the material, submit sufficient units to show limits of the variations. Include product name or name of the manufacturer.
- G. Architect will review each submittal, mark as appropriate to indicate action taken, and return copies less those retained. Compliance with specified requirements remains Contractor's responsibility.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 33 00 - SUBMITTALS

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 WORK INCLUDED

- A. Provide shop drawings, product data, physical samples and color samples as indicated herein and in each technical section of these specifications.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Additional submittal requirements specific to the particular section of the specifications.

PART 2 - PRODUCTS

2.1 SHOP DRAWINGS

- A. Prepare shop drawings using competent draftsmen, clearly and precisely showing the following:
 - 1. The size and gage of members.
 - 2. The method of anchoring and securing members of parts together.
 - 3. The quantity and location of each item.
 - 4. Other pertinent data necessary to show the Work to be done and where and how it is to be done.
- B. Prepare Drawings to scale, including full size details as required to fix and illustrate the Work required. Do not use Contract Documents or reproductions thereof as shop drawing submittals.
- C. Each sheet of Drawings shall be 30 x 40 inches maximum size with borders. Provide a title block in the lower right hand corner with the following information:
 - 1. Title of the sheet.
 - 2. Name and location of Project.
 - 3. Names of:
 - a. Architect/Engineer.
 - b. General Contractor.
 - c. Manufacturer of the specified materials and equipment.

4. The date of the Submittal.
 5. The date of each correction or revision.
 6. **Submittal number including Division No.** (such as submittal no. 3 under Division 11 is numbered "11-03").
- D. Fold drawings to 8-1/2x11 inch dimensions with title block exposed to top.
- E. Check the Drawings and add any corrections of field measurements needed. Stamp and sign the Contractor's approval, checker's signature, and date of approval before submitting to the Architect. Shop Drawings which do not bear the Contractor's stamp or have not been reviewed by the Contractor, will be returned by the Architect without review or approval.
- F. Number Shop Drawings consecutively. Indicate working and erection dimensions, arrangements, sectional views, necessary details including complete information for making connections with other Work, kinds of materials, and finishes.
- G. Provide a transmittal letter in duplicate, pointing out any deviations from items, methods or named manufacturers included in the Specifications or on the Drawings. Note submittal file number including Division.
- H. Submit six (6) blue line prints of each Shop Drawing sheet.
- I. Make such corrections, changes, resubmit bound sets of Shop Drawings prints, as required herein, until approved is obtained. Any corrections or changes indicated on Shop Drawings shall not be considered as an extra work order.

2.2 PHYSICAL SAMPLES

- A. Provide duplicate samples of items as specified. Samples shall be 12 inches square or 12 inches long unless noted otherwise. Minimum liquid samples shall be 1 pint. Installed materials shall match approved samples.
- B. For Architect's permanent files provide one (1) 6" x 6" sample of all interior finishes, colors and materials (aluminum finish, glazing, plastic laminate, paint finish flooring materials, ceiling finish, etc.)
- C. Provide a transmittal letter with each sample, listing the following:
1. Specification section title and paragraph specifying the material.
 2. Name and location of Project.
 3. Names of:
 - a. Architect/Engineer.
 - b. General Contractor.
 - c. Manufacturer of the specified materials and equipment.
 4. The date of the Submittal.
 5. Submittal file number including Division.
- D. If samples are not acceptable they will be returned directly to the Contractor for modification and resubmission.
- E. If samples are acceptable, notification will be sent directly to the Contractor, and the sample retained for comparison with the complete Work.
- F. Electronic samples are **not acceptable** (PDF, JPEG, TIFF, etc.).

2.3 MANUFACTURER'S PRODUCT DATA

- A. Provide **six (6)** copies of pre-printed Product Data of items as specified. Carefully mark out all items not applicable to the specified item.
- B. Standard catalogs, brochures, etc. including information not applicable to the project and not marked through, will be returned without review or approval.
- C. Provide a transmittal letter with the Product Data from each manufacturer, listing the following information:
 - 1. Name and location of Project.
 - 2. Names of:
 - a. Architect/Engineer.
 - b. General Contractor.
 - c. Manufacturer of the specified materials and equipment.
 - 3. The date of the Submittal.
 - 4. Submittal file number including Division.
- D. If Product Data is not approved, one copy will be marked and returned directly to the Contractor for modification and resubmission.
- E. If Product Data is approved, notification and one copy of the acceptable Product Data will be sent directly to the Contractor.
- F. When requested by the Architect, provide six (6) copies of each ASTM Federal Specification, or other applicable documents referenced in the material Section.

PART 3 - EXECUTION

3.1 REVIEW PROCEDURE

- A. Submittals will be reviewed with reasonable promptness so as to cause no delay, but only for conformance with the design concept of the project and with the information given in the Contract Documents. Architect shall be allowed a maximum review period of **fourteen (14)** calendar days. The review of a separate item shall not indicate a review of an assembly in which the item functions. Submittals that contain excessive errors or that are incomplete will be returned without review and approval and any delay caused thereby shall be the responsibility of the Contractor.
- B. If any submittals are not approved as submitted, all copies will be returned directly to the Contractor for revision. The reviewed submittals will be returned to the Contractor as soon as practicable.
- C. The Contractor shall make all revisions as noted and shall resubmit the required number of corrected copies of submittals, until no exceptions are taken. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than those requested on previous submissions.
- D. The review of submittals shall not relieve the Contractor of responsibility for deviations from the requirements of the Contract Documents unless the Contractor has submitted, in writing, such deviations and written approval has been given to each specific deviation. The review shall not relieve the Contractor from responsibility for errors and omissions in the Shop Drawings and samples.

- E. No portion of the Work requiring a submittal shall commence until the submittal has been approved as designated in the Conditions of the Contract. All such portions of the Work shall be in accordance with the submittal that has been stamped with final “Reviewed Without Exceptions” note, or “Approved” note.
- F. Materials and equipment specified or approved prior to beginning the Work are required to be used on the Project. Any proposed substitution resulting from no availability of specified items must be proven “better than” by the Contractor and approved in writing by the Architect. Substitutions included in submittals shall be so noted and brought to the Architect’s attention in the submittal and on the transmittal. Failure to follow this procedure will render the substitution as not acceptable whether or not reviewed by the Architect.
- G. The Contractor shall have the approved shop drawings at the site at all times for use in the construction of the Work. Failure of the Contractor to supply such drawings will be deemed sufficient cause to delay the Work until such drawings are available for field use and reference.
- H. For submittals that will be reviewed by one of the Architect’s consultants, these submittals shall be delivered directly to the Architect. The Architect will then be responsible to provide the Consultant with a copy of the submittal.
- I. For submittals that will be reviewed by one of the Architect’s consultants, do not send to the Consultant as part of the package any items which will be reviewed by the Architect. As an example, do not provide a single submittal package combining Structural Steel and Miscellaneous Metal Fabrications.

END OF SECTION

SECTION 01 35 16 — ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 SECTION INCLUDES

- A. Products and installation for patching and extending Work.
- B. Transition and adjustments.
- C. Repair of damaged surfaces, finishes, and cleaning.

1.3 RELATED SECTIONS

- A. Section 01 11 00 – Summary: Work sequence and Phasing.
- B. Section 01 73 29 – Cutting and Patching: Requirements and limitations for cutting and patching of work.
- C. Section 01 50 00 – Temporary Facilities and Controls: Temporary enclosures, protection of installed work, and cleaning during construction.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in product sections; match existing Products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing Products where necessary, referring to existing Work as a standard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that demolition is complete and areas are ready for installation of new Work.
- B. Beginning of restoration Work means acceptance of existing conditions.

3.2 PREPARATION

- A. Cut, move, or remove items as necessary for access to alterations and renovation Work. Store items scheduled for reinstallation. Replace and restore at completion.
- B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.
- E. Close openings in exterior surfaces to protect existing work, salvaged, and stored items from weather and extremes of temperature and humidity. Temporarily seal wall cavities and substrates exposed by cutting, patching, and demolition work to prevent accumulation and trapping of moisture which will allow the development of mildew.

3.3 INSTALLATION

- A. Coordinate work of alterations and renovations to expedite completion sequentially. Do not remove existing items which weatherproof buildings (windows, roofing, doors, exterior finishes etc.) until new materials and items are ready for installation.
- B. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring products and finishes to specified condition. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes, in accordance with Section 01 73 29 – Cutting and Patching.
- C. Install Products as specified in individual sections.

3.4 TRANSITIONS

- A. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- B. 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. Consult Architect for direction on making transitions.

3.5 ADJUSTMENTS

- A. Where removal of partitions or walls result in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
- B. Fit work at penetrations of surfaces as specified in Section 01 73 29 – Cutting and Patching.

3.6 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Repair substrate prior to patching finish.

3.7 FINISHES

- A. Finish surfaces as specified in individual Product sections.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

END OF SECTION

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 SECTION REQUIREMENTS

- A. Quality-control services include inspections, tests, and related actions including reports. Quality-control services are further specified in other Sections of these Specifications and shall be performed by independent testing agencies provided by Contractor or Owner, as specified.
 - 1. Unless otherwise indicated, quality-control services required by authorities having jurisdiction will be provided by Owner.
- B. Contractor is responsible for scheduling inspections and tests.
- C. **Retesting: Contractor shall pay for retesting where results of inspections and tests prove unsatisfactory and indicate noncompliance with requirements.**
- D. Auxiliary Services: Cooperate with agencies performing inspections and tests. Provide auxiliary services as requested. Notify agency in advance of operations requiring tests or inspections, to permit assignment of personnel. Auxiliary services include the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities to assist inspections and tests.
 - 3. Adequate quantities of materials that require testing, and assisting in taking samples.
 - 4. Facilities for storage and curing of test samples.
 - 5. Security and protection of samples and test equipment.
- E. Duties of Testing Agency: Testing agency shall cooperate with Architect and Contractor in performing its duties. Agency shall provide qualified personnel to perform inspections and tests.
 - 1. Agency shall promptly notify Architect and Contractor of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Agency shall not release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
 - 3. Agency shall not perform duties of Contractor.

- F. Submittals: Testing agency shall submit a certified written report of each inspection and test to the following:
 - 1. Owner.
 - 2. Architect.
 - 3. Contractor.
 - 4. Structural engineer.
 - 5. Authorities having jurisdiction, when authorities so direct.

- G. Report Data: Reports of each inspection, test, or similar service shall include at least the following:
 - 1. Name, address, and telephone number of testing agency.
 - 2. Project title and testing agency's project number.
 - 3. Designation (number) and date of report.
 - 4. Dates and locations where samples were taken or inspections and field tests made.
 - 5. Names of individuals taking the sample or making the inspection or test.
 - 6. Designation of the product and test method.
 - 7. Complete inspection or test data including an interpretation of test results.
 - 8. Ambient conditions at the time of sample taking and testing.
 - 9. Comments or professional opinion on whether inspected or tested Work complies with requirements.
 - 10. Recommendations on retesting or reinspection.
 - 11. Name and signature of laboratory inspector.

- H. Testing Agency Qualifications: Engage inspection and testing agencies that are prequalified as complying with the American Council of Independent Laboratories' "Quality Assurance Manual" and that specialize in the types of inspections and tests to be performed.
 - 1. Each testing agency shall be authorized by authorities having jurisdiction to operate in the state where Project is located.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 50 00 — TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone and fax service, water, and sanitary facilities.
- B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, and water control.
- C. Construction Facilities: Access roads, parking, progress cleaning, project signage and temporary buildings.

1.3 TEMPORARY ELECTRICITY

- A. Cost: By General Contractor. Temporary Electricity shall be provided up until Architect issues Substantial Completion.
- B. Utilize existing power service if approved by Owner. If existing power service usage is approved by the Owner, the Contractor shall reimburse the Owner for the dollar amount of electrical consumption during the course of construction. Extend temporary outlets in NEC and OSHA approved manner to facilitate construction.
- C. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
- D. Provide main service disconnect and over correct protection at convenient location.
- E. Provide sufficient and adequate distribution equipment, wiring, and outlets to ensure unimpeded progress of the Work.
- F. Permanent convenience receptacles may be utilized during construction.

1.4 TEMPORARY LIGHTING

- A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft.
- B. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.
- C. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- D. Permanent building lighting may be utilized during construction.
- E. Maintain lighting and provide routine repairs.

1.5 TEMPORARY HEAT

- A. Provide and pay for heating devices and heat as needed to maintain specified conditions for construction operations.
- B. Maintain minimum ambient temperature of 50 degrees F (10 degrees C) in areas where construction is in progress, unless indicated otherwise in product sections.

1.6 TEMPORARY COOLING

- A. If required for the proper installation of particular materials, systems, or equipment, provide and pay for cooling devices and cooling as needed to maintain specified conditions.

1.7 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidify, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Utilize existing ventilation equipment if approved by Owner. Extend and supplement equipment with temporary fan units as required to maintain clear air for construction operations.

1.8 TELEPHONE SERVICE

- A. Provide, maintain and pay for telephone service to field office.

1.9 FACSIMILE SERVICE

- A. Provide, maintain and pay for separate telephone line to be used solely for fax service to field office.

1.10 TEMPORARY WATER SERVICE

- A. Cost: By General Contractor. Utilize existing water service if approved by Owner for construction operations. If existing water service usage is approved by the Owner, the Contractor shall reimburse the Owner for the dollar amount of water consumption during the course of construction.

- B. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing as required.

1.11 TEMPORARY SANITARY

- A. Provide and maintain required facilities and enclosures. Existing facility use is **not** permitted. Provide at time of project mobilization.

1.12 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas to protect existing facilities and adjacent properties from damage from construction operations and demolition. Barriers must isolate occupied use from construction activities. If and when needed, barriers must be capable of attenuating sound.
- B. Provide protection for existing plant life and landscaped. Maintain plant life and landscaped areas as necessary during construction operations. Replace damaged plant life.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
- D. Barrier plan and method subject to approval by the Architect and the Owner.

1.13 FENCING

- A. Construction: Commercial grade chain link fence.
- B. Provide 6 foot high fence around construction site, equip with vehicular and pedestrian gates with locks. Fence must be capable of restricting entry by on-site facility users.

1.14 WATER CONTROL

- A. Grade site to drain where additions are undertaken. Maintain excavations free of water. Provide, operate, and maintain pumping equipment and/or any other means, methods or techniques necessary to maintain excavation and site free of water.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

1.15 EXTERIOR ENCLOSURES

- A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protect for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
- B. Provide temporary protection of existing wall cavities, substrates, and surfaces exposed to weather during cutting and minor demolition operations to prevent entrapment of moisture and development of mildew.

1.16 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection to prohibit damage and where specified in individual specification sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic in all landscaped areas.

1.17 SECURITY

- A. Provide security and facilities to protect Work and existing facilities from unauthorized entry, vandalism, or theft.
- B. Coordinate project security program with Owner's existing security operations at project mobilization.
- C. Maintain program throughout construction period until Owner acceptance precludes the need for Contractor security.
- D. Restrict entrance of persons and vehicles into Project site and existing facilities, allowing entrance only to authorized persons and persons identified by the Contract Document and/or the Architect or Owner as authorized to visit Project site.

1.18 ACCESS

- A. Provide and maintain temporary roads accessing public thoroughfares to serve construction area.
- B. Extend and relocate as work progress requires. Provide detours necessary for unimpeded traffic flow.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Existing on-site roads may be used for construction traffic.

1.19 PARKING

- A. Provide temporary surface parking areas to accommodate construction personnel. Existing site areas may be used if approved in advance by the Owner.
- B. Contractor to propose plan for Owner concurrence and approval.

1.20 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.

1.21 PROJECT IDENTIFICATION

- A. Provide project sign. Refer to drawings for size and content.
- B. Erect on site at location established by Architect.
- C. No other signs are allowed without Owner permission except those required by law.

1.22 FIELD OFFICES AND SHEDS

- A. Office: Weather tight with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture drawing rack, and drawing display table, phone and fax.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
- C. Provide storage sheds and facilities to accommodate Work. Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and for inspection of products to requirements of Section 01 25 00.
- D. Designated existing covered and uncovered hard paved areas and facilities may be used for field storage areas. Protect and secure existing areas used for storage. Upon completion of Work, clean, repair, and restore all existing areas used for storage and restore to acceptable condition.

1.23 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials prior to Substantial Completion.
- B. Remove underground installation to a minimum depth of 2 feet. Grade site to drain.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 73 29 — CUTTING AND PATCHING

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 SECTION INCLUDES

- A. Requirements and limitations for cutting and patching of Work.

1.3 RELATED SECTIONS

- A. Section 01 10 00 – Summary: Work by Owner or by separate Contractors.
- B. Section 01 35 16 – Alteration Project Procedures.
- C. Section 01 25 00 – Substitution Procedures.
- D. Individual Product Specification Sections:
 - 1. Cutting and patching incidental to work of the section.
 - 2. Advance notification to other sections of openings required in work of those sections.
 - 3. Limitations on cutting structural members.

1.4 SUBMITTALS

- A. Submit written request in advance of cutting or alteration which affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
- B. Include in request:
 - 1. Identification of Project.
 - 2. Location and description of affected Work.
 - 3. Necessity for cutting or alteration.
 - 4. Description of proposed Work and Products to be used.

5. Alternatives to cutting and patching.
6. Effect on work of Owner or separate Contractor.
7. Written permission of affected separate Contractor.
8. Date and time work will be executed.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Primary Products: Those required for original installation.
- B. Product Substitution: For any proposed change in materials, submit request for substitution in accordance with Section 01 25 00 – Substitution Procedures.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
- B. After uncovering existing Work, assess conditions affecting performance of work.
- C. Structural Elements: If any existing structural elements are damaged during the course of cutting and patching, contractor shall cease activities immediately and notify Architect. Contractor will be responsible to submit a plan for corrective work. This plan shall include a professional structural engineer's recommendation(s). All corrective work shall be at the expense of the General Contractor.
- D. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

- A. Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
- B. Provide protection from elements for areas which may be exposed by uncovering work. Avoid unnecessary or extended exposure to weather of work exposed by cutting. Avoid entrapment of moisture or other deleterious mater between existing substrates and new work.
- C. Maintain excavations free of water.

3.3 CUTTING

- A. Execute cutting and fitting including excavation and fill to complete the Work.
- B. Uncover work to install improperly sequenced work.
- C. Remove and replace defective or non-conforming work.

- D. Remove samples of installed work for testing when requested.
- E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight-exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

3.4 PATCHING

- A. Execute patching to complement adjacent Work.
- B. Fit Products together to integrate with other Work.
- C. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
- D. Employ skilled installer to perform patching for weather exposed and moisture resistant elements, and sight-exposed surfaces.
- E. Restore work with new Products in accordance with requirements of Contract Documents.
- F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- G. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

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.

1.2 ACTION SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. 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.
- C. Field Report: For pest control inspection.

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 Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Divisions 02 through 33 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 sustainable design submittals required in Division 01 sustainable design requirements Section and in individual Division 02 through 33 Sections.
 7. 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 Division 01 Section "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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.6 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 Division 01 Section "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 (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report.
- 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. Reinspection: Request reinspection 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.
 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.

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, three-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. Pest Control: Comply with pest control requirements in Division 01 Section "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls."

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 01700

SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 SECTION REQUIREMENTS

- A. Unless otherwise indicated, demolished materials become Contractor's property. Remove from Project site.
- B. Items indicated to be removed and salvaged remain Owner's property. Remove, clean, and deliver to Owner's designated storage area.
- C. Comply with EPA regulations and disposal regulations of authorities having jurisdiction.
- D. Conduct demolition without disrupting Owner's use of the building.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Maintain and protect existing utilities to remain in service before proceeding with demolition, providing bypass connections to other parts of the building.
- B. Locate, identify, shut off, disconnect, and cap off utility services to be demolished.
- C. Employ a certified, licensed exterminator to treat building and to control rodents and vermin.
- D. Conduct demolition operations and remove debris to prevent injury to people and damage to adjacent buildings and site improvements.
- E. Provide and maintain shoring, bracing, or structural support to preserve building stability and prevent movement, settlement, or collapse.

- F. Protect building structure or interior from weather and water leakage and damage.
- G. Protect remaining walls, ceilings, floors, and exposed finishes. Erect and maintain dustproof partitions. Cover and protect remaining furniture, furnishings, and equipment.
- H. Structural Elements: Field verify existing conditions prior to undertaking any demolition activities. Contractor shall investigate existing conditions prior to commencing saw cutting activities, partial concrete removal, concrete coring, penetrations into existing slab and structural steel/wood framing removal or cutting.
- I. Concrete Slab Demolition: If the existing concrete slab is damaged during the course of demolition (post tension cabling damage, rebar damage, aggregate damage, soil disturbance, etc.) contractor shall cease demolition activities immediately and notify Architect. Contractor will be responsible to submit a plan for corrective work. This plan shall include a professional structural engineer's recommendation(s). All corrective work shall be at the expense of the General Contractor.
- J. Structural and Framing Demolition: If any existing structural elements are damaged during the course of demolition (beams, columns, wood framing, rebar, plates, angles, etc.) contractor shall cease demolition activities immediately and notify Architect. Contractor will be responsible to submit a plan for corrective work. This plan shall include a professional structural engineer's recommendation(s). All corrective work shall be at the expense of the General Contractor.
- K. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
- L. Promptly patch and repair holes and damaged surfaces of building caused by demolition. Restore exposed finishes of patched areas and extend finish restoration into remaining adjoining construction.
- M. Promptly remove demolished materials from Owner's property and legally dispose of them. Do not burn demolished materials.

END OF SECTION

SECTION 05 41 00 — LIGHT GAGE METAL FRAMING SYSTEMS AND GYPSUM SHEATHING

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 WORK INCLUDED

- A. Furnish and install exterior/interior metal stud framing as shown on the drawings and specified herein.
- B. Furnish and install water resistant gypsum board sheathing at exterior face of exterior metal studs.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Masonry.
- B. Interior drywall systems.
- C. Wall Insulation.
- D. Dampproofing and Waterproofing.
- E. Exterior plaster (stucco).

1.4 SUBMITTALS

- A. Submit manufacturer's product data describing all materials.
- B. Submit manufacturer's certification of structural properties, only for products to be used in the project.

1.5 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.

1.6 DELIVERY, STORAGE AND HANDLING

- A. All materials shall be delivered in manufacturer's original packaging and stored flat in a covered, dry area providing protection from damage and exposure to the elements.
- B. Damaged or deteriorated materials shall be removed from the premises.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. STUDS AND FRAMING: Unimast, Clark Dietrich, Maverick Steel Co., Dale Industries, Delta Metals, Bostwick, American Studco Inc.
- B. GYPSUM BOARD SHEATHING: United States Gypsum Co., National Gypsum Co., Domtar Gypsum, Inc. Georgia Pacific, Temple Inland.

2.2 MATERIALS

- A. STRUCTURAL STUDS AND RUNNERS: Galvanized "Cee" studs in sizes and gauges as indicated in the drawings. Unless otherwise indicated in the drawings, minimum gauge shall be 16 gauge and the following structural properties shall apply:

SIZE	ABOUT MAJOR AXIS X-X			ABOUT MINOR AXIS Y-Y		
	lx	Sx	rx	ly	Sy	ry
3-5/8"	.906	.500	1.430	.139	.142	.614
4"	1.145	.572	1.566	.147	.143	.615
6"	3.016	1.005	2.262	.180	.149	.595
8"	6.071	1.518	2.923	.201	.152	.565

- B. SHEATHING FASTENERS: Unimast self-drilling screw fasteners (bugle head).
- C. SHEATHING: Fire resistant gypsum board with treated water resistant gypsum core surfaced with water repellant paper both faces -1/2" x 4' x 8' with tongue and groove joint design at long edges. Meet requirements of ASTM C-79. Provide 5/8" thick rated X core where specifically indicated on the drawings.
- D. All metal studs, track, and bridging shall be formed from ASTM A-446 commercial grade steel having a minimum yield of 33,000 psi for 18 gauge and lighter members and 50,000 psi for 16 gauge and heavier members.
- E. All framing components shall be galvanized. Tracks, runners, bridging and bracing shall match grade and gauge of studs.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install studs plumb and in plane, without twist. System installation shall be in accordance with AISI Design Manual for "Light Gauge Cold Formed Steel".
- B. All framing components shall be cut tight against abutting members. Members shall be held firmly in position until properly fastened.
- C. All attachments of axial loaded framing components shall be welded in accordance with the American Welding Society's "Recommended Practices for Resistance Welding" and shall transfer the imposed load into the adjoining member. Use no splices in axial loaded members.
- D. Attachments of framing components not subject to axial loads may be welded or screw fastened.
- E. Members shall be braced as required to resist all wind loads and construction loading for which the system has been designed. System shall be braced as erected and shall not be left overnight without adequate bracing.
- F. Framing components used to frame openings shall be of a size and type to transfer any load imposed on the opening into the members adjacent to the opening. Additional framing shall be provided adjacent to the opening to carry the load imposed.
- G. Welds in galvanized material shall be coated with "ZRC" cold galvanizing after wire brushing.

3.2 ERECTION

- A. TRACK FASTENING: Secure metal floor track to concrete floor slab with Type "A" or "B" fasteners spaced as scheduled in the table below. For determining unbraced wall height, ceiling does not qualify as bracing.
 - 1. Type "A" fastener – minimum 5/32" diameter x 1-1/4" long powder actuated fasteners. Hilti #DS32P10 or Ramset #2335.
 - 2. Type "B" fastener – minimum 1/4" diameter x 2" long drilled sleeve anchor. Hilti sleeve anchor or Ramset "Thunder Nail".
 - 3. Demonstrate to the Architect that fasteners can be driven full length into concrete slab tight to stud track.
 - 4. Use similar fasteners (and spacing) suitable for steel at overhead track or weld track to overhead steel at 12" o.c.
 - 5. At track splices use anchored channel inserts or fully weld.

Spacing Schedule for Type A & B Fasteners

MAX. SPACING OF FASTENERS	*MAX. UNBRACED WALL HEIGHT	
	TYPE A	TYPE B
24"	7.4 FT.	8.3 FT.
16"	11.1 FT.	12.4 FT.
12"	14.8 FT.	16.5 FT.
8"	24.9 FT.	24.9 FT.
6"	29.7 FT.	33.2 FT.

*NOTE: Ceiling at wall does not reduce unbraced wall height.

- B. **STUD FASTENING:** Each stud shall be fastened to top and bottom track (prior to gypsum board sheathing or interior wall finish) using one of the following two methods:
1. Screw fastening: One self-drilling screw at the front and back faces of the top and bottom tracks for each stud (4 fasteners per stud.)
 2. Welding: One weld at the front face of the top and bottom tracks for each stud (2 welds per stud).
 3. Additional: The above minimum fasteners are required regardless of any additional bracing or intermediate fastening which may be indicated in the drawings or required.
- C. **BRIDGING:** Provide bridging at all exterior stud walls whether or not indicated in the drawings. Unless more stringent requirements are indicated in the drawings provide the following:
1. Wind loading resistance only: Provide multiple bridging rows spaced 5'-0" o.c. vertically maximum.
 2. Axial loaded members: For stud lengths less than 10 feet, provide 2 rows of bridging at third points. For stud lengths 10 feet and greater, provide multiple bridging rows spaced 42" o.c. vertically maximum.
- D. **SHEATHING INSTALLATION:** Apply sheathing panels horizontally with the "v" edge turned up. Install with joints and penetrations tight and neatly fit. Stagger end joints over studs with screws spaced at maximum 12" centers at each stud and at 12" o.c. along top and bottom runners.

END OF SECTION

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 WORK INCLUDED

- A. Provide and install all rough carpentry, formwork, wood framing, blocking, wood furring, hardboard and related fasteners as indicated in the drawings or as required to complete the indicated construction.
- B. Install all related hardware and fasteners. Provide and install wood furring and/or trim for acoustical panels.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Cast-in place concrete
- B. Painting
- C. Finish hardware

1.4 SECTION REQUIREMENTS

- A. Submittals manufacturer's printed literature describing wood preservatives treatment system and certifying that system meets all current requirements for applicable Federal, State and local governing agencies.
- B. Submittals manufacturer's printed literature describing fire retardant treatment system, any structural or usage limitations, and certifying that system meets all current requirements for applicable Federal, State and local governing agencies.

1.5 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.

1.6 DELIVERY AND STORAGE

- A. Deliver and store lumber, plywood and hardwood on sills and cover for protection.

1.7 QUALITY ASSURANCE

- A. All lumber and plywood shall be grade marked by Southern Pine Inspection Bureau, West Coast Lumber Inspection Bureau, American Plywood Association, or Western Wood Products Association.
- B. All lumber and plywood shall be marked with producing manufacturer's trademark.
- C. Certificate of inspection issued by grading association for bundled lumber and plywood may substitute for individual piece marking.

PART 2 - PRODUCTS

2.1 LUMBER, GENERAL

- A. Dressed lumber, S4S, [19] [15] percent maximum moisture content for 2-inch (38-mm) thickness or less, marked with grade stamp of inspection agency.

2.2 TREATED MATERIALS

- A. Preservative-Treated Materials: AWPAC2 lumber and AWPAC9 plywood, labeled by an inspection agency approved by ALSC's Board of Review. After treatment, kiln-dry lumber and plywood to 19 and 15 percent moisture content, respectively. Treat indicated items and the following:
 - 1. Wood members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Concealed members in contact with masonry or concrete.
 - 3. Wood framing members less than 18 inches (460 mm) above grade.
 - 4. Wood floor plates installed over concrete slabs directly in contact with earth.
- B. Fire-Retardant-Treated Materials: AWPAC20 lumber and AWPAC27 plywood, interior Type A treatment, labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Use treated lumber and plywood with bending strength, stiffness, and fastener-holding capacities that are not reduced below values published by manufacturer of chemical formulation under elevated temperature and humidity conditions.

2.3 LUMBER

- A. Miscellaneous Lumber: No. 3 or Standard grade of any species for nailers, blocking, and similar members as indicated on drawings.

2.4 MISCELLANEOUS PRODUCTS

- A. Fasteners: Size and type indicated. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.

1. Power-Driven Fasteners: CABO NER-272.
 2. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- B. Metal Framing Anchors: Hot-dip galvanized steel of structural capacity, type, and size indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. COORDINATION: Coordinate work with other trades and provide cutting and patching required to accommodate the work. Verify all dimensions by taking field measurements to ensure proper fit. Accurately cut framing and blocking, and fit true to line and level, avoiding shims and wedges.
- B. Fit rough carpentry to other construction; scribe and cope for accurate fit. Correlate location of furring, blocking, and similar supports to allow attachment of other construction.
- C. ANCHORING AND FASTENTING: Use largest practicable fasteners for each type of work. Bolt nailers and blocking to steel, masonry or concrete members using bolts of proportionate strength to members attached. Unless otherwise noted in the drawings use $\frac{3}{4}$ " diameter bolts at maximum 4'-0" centers. Use concealed fasteners in finish work, set nails and use flathead countersunk screws.
- D. WOOD BLOCKING: Install fire-retardant tread wood blocking between metal studs where wall-supported drinking fountains, casework, railings, and other equipment is attached. Install between studs for toilet partitions systems and toilet accessories where anchored to wall. Use minimum 2 x 4 dimension where not indicated otherwise in the drawings.

END OF SECTION

SECTION 06 16 43 - GYPSUM SHEATHING

PART 1 GENERAL

1.00 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.01 SUMMARY

- A. Section Includes: Fiberglass-mat faced, moisture and mold resistant gypsum sheathing.
- B. Related Sections:
 - 1. Section 05 41 00 Structural Metal Stud Framing.
 - 2. Section 06 10 00 Rough Carpentry.
 - 3. Section 09 21 16 Gypsum Board Assemblies.

1.02 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products.
 - 2. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 3. ASTM C1002 Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - 4. ASTM C1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - 5. ASTM C1280 Standard Specification for Application of Gypsum Sheathing.
 - 6. ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 - 7. ASTM D6329 Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers.
 - 8. ASTM E72 Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
 - 9. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.
 - 10. ASTM C1396 Standard Specification for Gypsum Board
- B. Gypsum Association (GA): GA-253 Application of Gypsum Sheathing.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's specifications and installation instructions for each product specified.

1.04 WARRANTY

- A. Provide products that offer twelve months of coverage against in-place exposure damage (delamination, deterioration and decay) commencing with the date of installation of the product in such structure.
- B. Manufacturer's Warranty:
 - 1. Five years against manufacturing defects from the date of purchase of the product for installation
 - 2. 12 years against manufacturing defects when used as a substrate in architecturally specified EIFS.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Georgia-Pacific Gypsum LLC:
 - 1. Fiberglass-Mat Faced Gypsum Sheathing: DensGlass Sheathing.
 - 2. Fiberglass-Mat Faced Gypsum Sheathing, Type X for Fire Rated Designs: DensGlass Fireguard Sheathing.
- B. Size:
 - 1. Thickness: 5/8 inch.
 - 2. Width: 4 feet.
 - 3. Length: 8 feet.
 - 4. R-Value: (ASTM C518) 0.67
- C. Substitutions will be in accordance with Section 01 25 00.

2.02 ACCESSORIES

- A. Screws: ASTM C1002, corrosion resistant treated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions:
 - 1. Inspection: Verify that project conditions and substrates are acceptable, to the installer, to begin installation of work of this section.

3.02 INSTALLATION

- A. General: In accordance with GA-253, ASTM C1280 and the manufacturer's recommendations.
 - 1. Manufacturer's Recommendations:
 - a. Current "Product Catalog", Georgia-Pacific Gypsum.

3.03 PROTECTION

- A. Protect gypsum board installations from damage and deterioration until date of Substantial Completion.

END OF SECTION

SECTION 07 10 00 — DAMPPROOFING AND WATERPROOFING

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 WORK INCLUDED

- A. Provide and install below-grade waterproofing.
- B. Provide and apply dampproofing on weather side of inside wythe of all exterior masonry cavity walls.
- C. Provide and apply dampproofing and joint taping on weather side of gypsum board sheathing.
- D. Provide and install membrane waterproofing (flashing) at exterior walls as indicated in the drawings and specified herein.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Unit masonry.
- B. Gypsum sheathing.
- C. Flashing at roof.
- D. Plastic membrane under slab-on-grade.
- E. Waterstops.
- F. Metal thru-wall flashing.

1.4 SUBMITTALS

- A. Submit manufacturer's printed literature describing each material, restrictions, and manufacturer's recommended procedures. Submit samples of each material.

- B. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

1.5 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the Work under this section for a period of one year after the date of Substantial Completion of the Project.

1.6 QUALITY ASSURANCE

- A. Waterproofing company shall have a minimum of 3 years experience in the dampproofing and waterproofing of building structures of similar size and scope as this project.
- B. Retain at the job site a properly calibrated gauge for use by the Architect to verify applied thickness of materials.

PART 2 - PRODUCTS

2.1 WALL MATERIALS

- A. MEMBRANE FLASHING: 40 mil thick polyethylene backed SBS modified bitumen self-adhering black membrane; "Protecto Flash" as manufactured by Protecto Wrap Co. or "Perm-A-Barrier" as manufactured by W.R. Grace and Co. or "Blueskin SA" as manufactured by Henry Company. Membrane shall comply with the following:
 - 1. Tensile Strength: ASTM D412; 1400 psi.
 - 2. Elongation: ASTM D412; 200% min.
 - 3. Water Absorption: ASTM D570; 0.1% max.
- B. DAMPPROOFING: Non-asbestos emulsion type coating No. 352 over No. 207 adhesive primer, as manufactured by Gulf States Asphalt or approved equivalent by Henry Company, Karnak, W.R. Meadows, Celotex, or Sonneborn. Comply with ASTM D1227, Type 1.
- C. SHEATHING TAPE: 4" wide glass fabric scrim complying with ASTM D1668 or 40 mil thick polyethylene backed SBS modified bitumen self-adhering tape as manufactured by Protecto Wrap Co. or equivalent by W.R. Grace and Co or Henry Company. Verify compatibility of tape with proposed dampproofing.

2.2 BELOW GRADE WATERPROOFING:

- A. WALLS: "Hydrocide Liquid Membrane 5000T", one part cold applied elastomeric, modified urethane. Trowel applied, non-sag, as manufactured by Sonneborn or approved equivalent by Toch Bros. or Tremco or Henry Company.
- B. SLABS: "Hydrocide Liquid Membrane, HLM 5000" Cold Applied Seamless Elastomeric, Modified Urethane for use between concrete seal slab and concrete slab-on-grade as manufactured by Sonneborn or approved equivalent by Toch Bros. or Tremco or Henry Company.
- C. PROTECTION BOARD: Water-resistant, semi-rigid panel composed of a core of asphalt and inorganic mineral filler particles, bottom reinforcing cover of asphalt-saturated felt and top cover of fiber glass mat weather-coated with a bond-breaking film, as manufactured by W.R. Meadows, Inc or Henry Company.

- D. INSIDE ELEVATOR PIT: “Sonoblock” cementitious base slurry as manufactured by Sonneborn-Contech.
- E. WATERSTOPS: Reference concrete section.

2.3 SHOWER PANS:

- A. MEMBRANE SHOWER PAN: 30 mil thick synthetic, heavy-duty, flexible membrane PVC sheet, Nervastral 300.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Contractor shall inspect exterior face of all masonry cavity walls to ensure that all penetrations and joints are completely filled prior to dampproofing operations beginning.

3.2 MEMBRANE FLASHING

- A. Prime concrete and masonry surfaces scheduled to receive membrane flashing using flashing manufacturer’s recommended primer to ensure good adhesion.
- B. WALL FLASHINGS: Shall be installed above all openings occurring in an exterior wall, at base of exterior wall, and at wall interruptions by columns, beams, slabs, spandrels and other locations as indicated in the drawings. Flashing shall extend to within 1” of outside face of wall, shall be continuous and shall extend through cavity and be turned up to the top first course above finish floor on face of inner wythe, and to extend 1” minimum into back up or inner wythe. End laps to be 9” and side laps 6”.
- C. STEEL STRUCTURE: Cover all steel columns or beams in exterior walls not protected by dampproofed concrete block or sheathing. Cover steel completely with membrane flashing lap 6” on to masonry on each side of columns. Conform and adhere to steel shapes not fireproofed. Cover all protruding angles or miscellaneous steel.
- D. FRAMES: Install at exterior window and door frames and other locations as indicated in the drawings.
- E. SHEATHING: Wrap all corners of gypsum board sheathing. See drawings for other details.

3.3 SHEATHING TAPE: Use one of the following systems:

- A. Imbed and cover glass fabric scrim tape in dampproofing mastic at all joints, cracks and penetrations at gypsum board sheathing.
- B. Apply specified self-adhering tape continuously over all joints, cracks and penetrations prior to beginning dampproofing operations.

3.4 DAMPPROOFING

- A. Spray or brush apply dampproofing coating to weather side of all gypsum sheathing and primed concrete block back-up at exterior masonry cavity walls in accordance with the following:
 - 1. Primer: Minimum ½ gallon material per 100 sq. ft. of wall surface.
 - 2. Coating: Minimum 2/32" (62.5mils) dry film thickness and minimum 5 gallons material per 100 sq. ft.
- B. Cover all corners and work thoroughly into all joints, cracks, or crevices. Finished coating shall be monolithic and free of pin holes or cracks. Seal cracks, voids and joints at dissimilar materials with glass fabric embedded in dampproofing coating.
- C. Seal around penetrations including all masonry anchors.
- D. Dampproofing shall be applied only when temperature is at 50 degrees F. and rising or above, and when no rain is forecast for the 24 hour period following application. No dampproofing shall be covered by masonry prior to observation by the Architect. All dampproofing shall dry for a minimum of 24 hours prior to being covered by finish masonry.

3.5 BELOW GRADE WATERPROOFING

- A. LIQUID MEMBRANE:
 - 1. Install liquid membrane systems at earth side of all below grade walls, between sub-slab ("mud-slab") and structural slab, and all outside surfaces of elevator pit. Allow concrete work to cure a minimum of 14 days. All surfaces shall be smooth, dry, sound and free of honeycombs. Concrete shall be free of curing and parting compounds, wax or other foreign materials.
 - 2. Static joints or cracks less than 1/8" wide shall be sealed with "HLM" as manufactured by waterproofing manufacturer. Material shall fill and over-lap the edges of the joint to a width of 4" on both sides and shall have a minimum surface thickness of 55 (+5) mils.
 - 3. Immediately prior to application of membrane, remove all dust and dirt by use of high-pressure air, by brushing with a soft broom or vacuum cleaning.
 - 4. Apply material at a rate of 4 gallons per 100 square feet of surface to produce a membrane of 55 (+5) mil thick. Carefully control application to avoid runs and sags of fresh material.
 - 5. Apply membrane to prestripped areas at cracks, joints, intersections, penetrations, etc., to provide a minimum total thickness of 110 mils over these areas. Mask any membrane edge exposed to view to provide a straight clean edge.
 - 6. Before the membrane attains a final set, verify the applied thickness by use of a mil-thickness gauge. Where readings indicate a thickness less than specified, immediately apply additional membrane to produce required thickness.
 - 7. Following the application of the membrane, place protection boards over the membrane waterproofing at walls receiving backfill. Use membrane material as required to adhere protection boards. Boards shall be firmly in place with joints closely butted and sealed with gusset tape before backfilling is started.
 - 8. Protect membrane during construction. Any punctures or cuts in the membrane shall be patched and sealed in the manner described above for sealing joints in the sheeting.

3.6 SHOWER PANS

- 1. Ensure that surfaces receiving shower pan are clean, thoroughly dry and free from rough surfaces and sharp projections.
- 2. One-ply of 30 mil sheet shall be applied over concrete surface by embedding it in a coat of Nerva-Plast mastic trowel-applied at a rate of 40 sq. ft. per gallon. Turn up perimeter a minimum of 4".
- 3. Seal joints with 3" and final 2" wide strips of Nervastral tape in accordance with manufacturer's recommendations. Preform all corners and make without joints.
- 4. Roll entire horizontal area with 50 to 100 lb. Roller. Set corners and turn-ups with rubber roller.

END OF SECTION

SECTION 07 21 00 - BUILDING INSULATION

PART 1 - GENERAL

1.0 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Polystyrene foam insulation
 - 2. Open cell spray foam insulation
 - 3. Chicken Wire
 - 4. Fiberglass roll or batt insulation
 - 5. Polyencapsulated Batt Insulation
 - 6. Fiberboard ceiling insulation underlayment
- B. Related Sections include the following:
 - 1. Section 09 21 16.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: Full-size units for each type of exposed insulation indicated.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.
- D. Research/Evaluation Reports: For foam-plastic insulation.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source.

- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: ASTM E 84.
 - 2. Fire-Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect plastic insulation as follows:
 - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
 - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Extruded-Polystyrene Board Insulation:
 - a. DiversiFoam Products.
 - b. Dow Chemical Company.
 - c. Owens Corning.
 - d. Tenneco Building Products.

2.2 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
 - 1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.

- B. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and density indicated below, with maximum flame-spread and smoke-developed indices of 75 and 450, respectively:

1. Type X, 1.30 lb/cu. ft.

- C. Open Cell Spray Foam Insulation:

1. Icynene LD-R-50
2. Demilec Sealection 500
3. Application: Exterior Walls and other locations as indicated on plans.

- D. Polyencapsulated Batt Insulation

1. Johns Manville
2. Owens Corning
3. Certainteed

Encapsulated, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).

1. Roof/Ceiling Cavity: R-19
2. Exterior Walls: R-19

- E. Batt or Roll Insulation:

1. Johns Manville
2. Owens Corning
3. Certainteed

General: Insulation shall be fine fiber, flexible, resilient glass fiber blanket. Moisture absorption shall be less than .2% by volume.

1. Interior Stud Walls: 3 5/8" x 16" wide x 96" sound attenuation batts "R" factor 11. Unfaced.
2. Interior Stud Walls: 6" x 16" wide x 96" sound attenuation batts "R" factor 19. Unfaced
3. Above Acoustical Ceilings: 6" x 24" wide x 96" thermal batt insulation kraft faced fiberglass. "R" factor 19

AUXILIARY INSULATING MATERIALS

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.
- B. Chicken Wire: Provide as support for encapsulated batt insulation attached to the underside of metal building roof z girts.
- C. Fiberboard ceiling insulation underlayment: Provide over scheduled ceilings as substrate to apply sprayed foam insulation. Provide Celotex or equivalent product.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Review and insure chemical compatibility of cavity wall dampproofing membrane and cavity rigid insulation board prior to installation.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.
- B. Close off openings in cavities receiving poured-in-place insulation to prevent escape of insulation. Provide bronze or stainless steel screens (inside) where openings must be maintained for drainage or ventilation.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturers written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Water-Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- E. Apply single layer of insulation to produce thickness indicated, unless multiple layers are required to make up total thickness.

3.4 INSTALLATION OF FOAM INSULATION

- A. Per manufacturer's instructions. Installation by approved applicator only.

3.5 INSTALLATION OF CAVITY WALL INSULATION

- A. On units of plastic insulation, install small pads of adhesive spaced approximately 24 inches o.c. both ways on inside face, as recommended by manufacturer. Fit courses of insulation between confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against sheathing.

3.6 INSTALLATION OF POLYENCAPSULATED BATTS

- A. Encapsulated batts at vertical wall surfaces are to be attached with self tapping screws where attached at z girts. Batts at metal stud wall shall form fit to cavity.

3.7 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates by method complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Set vapor-retarder-faced units with vapor retarder to warm side of construction. Do not obstruct ventilation spaces, except for firestopping.
 - 1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
- C. Apply spray foam insulation in strict compliance with insulation manufacturers' written recommendations by manufacturer approved applicator only. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make it even with studs by using method recommended by insulation manufacturer.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 SECTION REQUIREMENTS

- A. Submittals: Product Data and color Samples.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under service and application conditions.
- B. Elastomeric Sealants: Comply with ASTM C 920.
 - 1. Single-component, neutral-curing silicone sealant, Type S; Grade NS; Class 25; Uses T, M, and O, with the additional capability to withstand [50 percent movement in both extension and compression for a total of 100 percent movement] [100 percent movement in extension and 50 percent movement in compression for a total of 150 percent movement]. Use for building expansion joints.
 - 2. Single-component, nonsag polysulfide sealant, Type S; Grade NS; Class 12-1/2; Uses NT, M, G, A, and O. For general exterior use.
 - 3. Single-component, neutral-curing silicone sealant, Type S; Grade NS; Class 25; Uses T, NT, M, G, A, and O. For general exterior use.
 - 4. Single-component, nonsag urethane sealant, Type S; Grade NS; Class 25; and Uses NT, M, A, and O. For general exterior use.
 - 5. Single-component, nonsag urethane sealant, Type S; Grade NS; Class 25; Uses T, NT, M, G, A, and O. Use for exterior traffic-bearing joints, where slope precludes use of pourable sealant.
 - 6. Single-component, pourable urethane sealant, Type S; Grade P; Class 25; Uses T, M, G, A, and O. Use for exterior traffic-bearing joints.
 - 7. Single-component, mildew-resistant silicone sealant, Type S; Grade NS; Class 25; Uses NT, G, A, and O; formulated with fungicide. Use for interior sealant joints in ceramic tile, stone, and other hard surfaces in kitchens and toilet rooms and around plumbing fixtures.

- C. Latex Sealant: Single-component, nonsag, mildew-resistant, paintable, acrylic-emulsion sealant complying with ASTM C 834. For interior use only at perimeters of door and window frames.
- D. Acoustical Sealant for Exposed Joints: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834. For interior use only at acoustical assemblies.
- E. Acoustical Sealant for Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce transmission of air-borne sound. For interior use only at acoustical assemblies.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with ASTM C 1193.
- B. Comply with ASTM C 919 for use of joint sealants in acoustical applications.

END OF SECTION

SECTION 07 95 10 - CAULKING

PART 1 - GENERAL

1.01 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.02 DESCRIPTION:

- A. WORK INCLUDED: Throughout the project, caulk and seal all joints where shown on the Drawings and elsewhere as required to provide a positive barrier against passage of air and passage of moisture.

1.03 QUALITY ASSURANCE:

- A. Qualifications of Installers:
 - 1. Proper caulking and proper installation of sealants require that installer be thoroughly trained and experienced in the necessary skills and thoroughly familiar with the specified requirements.
 - 2. For caulking and installation of sealants throughout the work, use only personnel who have been specifically trained in such procedures and who are completely familiar with the joint details shown on the Drawings and the installation requirements called for in this Section.

1.04 SUBMITTALS:

- A. General: Comply with provisions of Section 01 30 00.
- B. Manufacturer's Data: Submit:
 - 1. A complete materials list showing all items proposed to be furnished and installed under this Section.
 - 2. Sufficient data to demonstrate that all such materials meet or exceed the specified requirements.
 - 3. Samples: Accompanying the submittal required in Paragraph "B" submit samples of each sealant, each backing material, each primer, and each bond breaker proposed to be used.

1.05 PRODUCT HANDLING:

- A. Delivery and Storage: Deliver all materials of this Section to the jobsite in the original unopened containers with all labels intact and legible at time of use. Store only under conditions recommended by the manufacturers. Do not retain on the jobsite any material which has exceeded the shelf life

recommended by its manufacturer.

- B. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 CAULKING:

- A. General: Except as otherwise approved by the Architect, in writing, use only the type of caulking described in this Article.
- B. Caulking Materials:
 - 1. Around Fixed Glass "Storefront" Aluminum Frames use silicone based caulking in color matching the aluminum. This caulking furnished and installed by "storefront" aluminum installer.
 - 2. Around Windows: (if any) Use DAP Acrylic Latex Caulk with Silicone, in color to match window color or approved equal.
 - 3. Around Exterior Door Frames: Use DAP Acrylic Latex Caulk with silicone in "Clear" color or approved equal.
 - 4. Miscellaneous Exterior Connections Between Dissimilar Materials: Use DAP Acrylic Latex Caulk with silicone in "Clear" color unless another standard color of the manufacturer would be more suitable.
 - 5. Exterior Masonry Control Joints: Use Dow Corning 790 sealant or approved equal. Prime where required by manufacturer. Provide foam backer rod approved for use by sealant manufacturer.
 - 6. Interior Caulking: Use DAP Acrylic Latex Caulk with silicone or approved equal. Color as selected from manufacturer's standard colors.
 - 7. Caulking Joints Not Otherwise Specified: Use DAP Acrylic Latex Caulk with silicone or approved equal.
 - 8. Top-of-wall sealant for fire rated masonry wall sealant shall be: CP606, CP 672 with respective UL No. recommended by Hilti Company.
 - 9. Fire rated wall penetrations shall be: FS-one intumescent fire stop sealant with respective UL No. recommended by Hilti Company.
 - 10. Smoke and acoustical walls sealant shall be: CP506 Sealant by Hilti.
 - 11. Exterior/Interior of Masonry Walls Dow Corning 790 silicone sealant.
- C. Prime:
 - 1. In accordance with sealant manufacturer recommendations.

PART 3: EXECUTION:

3.01 INSPECTION:

- A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to the proper and timely completion of the Work. Do not proceed until satisfactory conditions have been corrected.

3.02 PREPARATION:

A. All Surfaces:

1. All surfaces in contact with caulking shall be dry, sound, and well brushed and wiped free from dust, and oil or grease.
2. Use solvent, where necessary, to remove oil and grease, wiping the surfaces with clean rags.
3. Remove all mortar from the joint cavity.
4. Where backstop is required, insert the approved backup material in the joint cavity to the depth required.

3.03 INSTALLATION OF SEALANTS:

- A. General: Prior to start of installation in each joint, verify the joint type, and verify that the required proportion of width of joint to depth of joint has been secured.
- B. Equipment: Apply sealant under pressure with hand or power-actuated gun or other appropriate means. Guns shall have nozzle of proper size and shall provide sufficient pressure to completely fill joints as designed.
- C. Masking: Thoroughly and completely mask all joints where the appearance of sealant on adjacent surfaces would be objectionable.
- D. Installation of Sealant: Install the sealant in strict accordance with the manufacturer's recommendations thoroughly filling all joints to the recommended depth.
- E. Tooling: Tool all joints to the profile recommended by the caulking manufacturer or as shown by details in the Drawings.
- F. Cleaning Up:
 1. Remove masking tape immediately after joints have been tooled.
 2. Clean adjacent surfaces free from sealant as the installation progresses. Use solvent or cleaning agent as recommended by the sealant manufacturer.

END OF SECTION

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 RELATED DOCUMENTS

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

1.3 SUMMARY

- A. Section Includes:
 - 1. Standard hollow metal doors and frames.
- B. Related Sections:
 - 1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
 - 2. Division 08 Section "Wood Doors" for wood doors in hollow metal frames.
 - 3. Division 08 Section "Door Hardware (Scheduled by Describing Products)" for door hardware for hollow metal doors and frames.
 - 4. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

1.4 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings.
- B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, temperature-rise ratings, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door design.
 - 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.
 - 6. Details of anchorages, joints, field splices, and connections.
 - 7. Details of accessories.
 - 8. Details of moldings, removable stops, and glazing.
- C. Samples for Verification:
 - 1. Samples are only required by request of the architect and for manufactures that are not current members of Steel Door Institute.
 - 2. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches (75 by 125 mm).
 - 3. For the following items, prepared on Samples about 12 by 12 inches (305 by 305 mm) to demonstrate compliance with requirements for quality of materials and construction:
 - a. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
 - b. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow metal panels and glazing if applicable.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.
- B. Preinstallation Conference: Conduct conference at Project site for hollow metal frames requiring electrical knockout boxes to verify installation of conduit on frames.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- (102-mm-) high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.9 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with this section requirements, provide products by one of the following:
 - 1. Amweld Building Products, LLC.
 - 2. Ceco Door Products; an Assa Abloy Group company.
 - 3. Curries Company; an Assa Abloy Group company.
 - 4. Steelcraft; an Ingersoll-Rand company.
 - 5. No Substitution; only material from an SDI member will be allowed on the jobsite unless prior approval is given in accordance with substitution request requirements per General Requirements section.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366 (ASTM A 366M), commercial quality, or ASTM A 620 (ASTM A 620M), drawing quality, special killed.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- E. Glazing: Comply with requirements in Division 08 Section "Glazing."

2.3 STANDARD HOLLOW METAL DOORS

- A. General: Provide 1 3/4" thick beveled and handed doors of design indicated, fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.
 - 1. Design: Flush panel

2. Core Construction: Manufacturer's standard polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core.
 3. Vertical Edges for Single-Acting Doors: Beveled edge
 - a. Beveled Edge: 1/8 inch in 2 inches (3 mm in 50 mm).
 4. Vertical Edges for Double-Acting Doors: Round vertical edges with 2-1/8-inch (54-mm) radius.
 5. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- (1.0-mm-) thick, end closures or channels of same material as face sheets.
 6. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheets. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Level 2 and Physical Performance Level A (Heavy Duty), 16 gage (0.053-inch - 1.3-mm-) thick steel faces, with threat side of door exceeding 14 gage (0.067-inch - 1.7-mm-) thick steel, Model 2 (Seamless face and edges).
 2. Provide doors with 22 gage Z-Channels steel stiffeners placed at 6 inches apart with foamed in place polyurethane core.
 3. Provide thermal insulation with calculated R factor of 11.01 per ASTM C518 Standards.
- C. Interior Doors: Face sheets fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Level 3 and Physical Performance Level A (Extra Heavy Duty), minimum 16 gauge (0.053-inch - 1.3-mm-) thick steel, Model 2 (Seamless face and edges).
- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- E. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2.4 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Exterior Frames: Fabricated from metallic-coated steel sheets.
1. Fabricate frames with mitered or coped corners.
 2. Fabricate frames as face welded joints and back weld joints continuously, unless otherwise indicated.
 3. Frames for Level 3 Steel Doors: minimum 14 gauge 0.067-inch- (1.7-mm-) thick steel sheet.
- C. Interior Frames: Fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated.
1. Fabricate frames with mitered or coped corners.
 2. Fabricate frames as face welded unless otherwise indicated.
 3. Fabricate knocked-down, drywall slip-on frames for in-place gypsum board partitions.
 4. Frames for Level 3 Steel Doors: minimum 16 gauge 0.053-inch- (1.3-mm-) thick steel sheet.
 5. Frames 48-inches and wider in opening width are required to be minimum 14 gauge 0.067-inch- (1.7-mm-) thick steel sheet.

6. Frames for Wood Doors: minimum 16 gauge 0.053-inch- (1.3-mm-) thick steel sheet.
7. Frames for Borrowed Lights: minimum 16 gauge 0.053-inch- (1.3-mm-) thick steel sheet.

- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

- B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.6 STOPS AND MOLDINGS

- A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch (0.8 mm) thick, fabricated from same material as door face sheet in which they are installed.
- B. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated.
- C. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch (0.8 mm) thick, fabricated from same material as frames in which they are installed.

2.7 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches (0.4 mm) thick.

2.8 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8
- C. Hollow Metal Doors:

1. Exterior Doors:
 - a. Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Top of door to be flush and completely sealed joints in top edges of doors against water penetration.
 - b. Provide Polyurethane core.
 2. Glazed Lites: Factory cut openings in doors with applied flush trim to fit.
 3. Astragals: Provide overlapping astragal as noted in door hardware sets in Division 8 Door Hardware on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch (19 mm) beyond edge of door on which astragal is mounted.
 4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 8 Door Hardware.
 5. Seamless Edge: Provide seamless edge on hollow metal doors by intermittently tack welding seam, grinding smooth and finishing edge free from defects and blemishes.
- D. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible. Continuously backweld joints at exterior frames.
 2. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 3. Equal Rabbet Frames: Provide frames with equal rabbet dimensions unless glazing and removable stops required wider dimension on glass side of frame.
 4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 42-inch and wider with mortise/butt type hinges only at top hinge location to deter against hinge reinforcement sag.
 5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 8 Door Hardware.
 6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops; provide security head screws at exterior locations.
 7. Grout Guards: Weld guard boxes to frame at back of mortise hardware prep in frames at all hinge, strike and other recessed hardware preps regardless of grouting requirements.
 8. Provide A60 Galvannealed coating at frames in restrooms with showers/Jacuzzi, clean areas such as surgery rooms and surgical suites, clean rooms, and soil rooms.
 9. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
 10. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Two anchors per jamb up to 60 inches (1524 mm) high.
 - 2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
 - b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:

- 1) Three anchors per jamb up to 60 inches (1524 mm) high.
 - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
 - 5) Two anchors per head for frames above 42 inches (1066 mm) wide and mounted in metal-stud partitions.
11. Door Silencers: Except on weather-stripped or gasketed doors, drill stops to receive door silencers as follows. Keep holes clear during construction. Silencers to be supplied by frame manufacture regardless if specified in division 8 Door Hardware.
- a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- E. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.
- F. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
- G. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricators shop
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that glazed lites are capable of being removed independently.
 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 4. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.
 5. Gap for butted or mitered joints in glass stop should not exceed .0625-inch.
- 2.9 STEEL FINISHES
- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
 - 1. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - 2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - 3. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - 4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.
- C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.
 - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-protection-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable glazing stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.

- e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.
- 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post installed expansion anchors.
 - a. Floor anchors may be set with powder-actuated fasteners instead of post installed expansion anchors if so indicated and approved on Shop Drawings.
- 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
- 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
- 5. Concrete Walls: Solidly fill space between frames and concrete with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
- 6. Field Supplied Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
- 7. Grouting Requirements:
 - a. Do not grout head of frames unless reinforcing has been installed in head of frame.
 - b. Do not grout vertical or horizontal closed mullion members.
- 8. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
 - b. Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).
 - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
 - 3. Smoke-Control Doors: Install doors according to NFPA 105.
- D. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (50 mm) o.c. from each corner.
 - a. Secure exterior removable stops with security head screws.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION

SECTION 08 71 63
DETENTION DOOR HARDWARE

PART 1 GENERAL

1.1. SCOPE OF WORK

- A. Furnish and install detention hardware as specified herein.
- B. Related Work:
 - 1. Section 083463 "Detention Doors and Frames"
 - 2. Section 088853 "Security Glazing"

1.2. REFERENCES

- A. ASTM F1577-95 Test Methods for Detention Locks for Swing Doors
- B. ASTM F1643-95 Test Methods for Detention Sliding Door Locking Device Assembly C. National Electrical Code, latest edition, for internal electrical requirements for hardware

1.3. SUBMITTALS:

- A. Make submittals in accordance with the requirements of Division 1 Section 013300.
- B. Submit specifications, installation instructions and general recommendations for products as required, including locks, hinges, lock mount covers, bolt keepers, wall bumpers, weather-stripping, thresholds, escutcheons, etc.
- C. If requested by Architect or Owner, submit one sample of each hardware product, finished as required and tagged with full description for coordination with hardware schedule. Samples will be used as extra stock, if approved. Rejected samples will be returned. D. Hardware and Keying Schedules:
 - 1. Submit one reproducible and one copy of each schedule type; indicate all products by name and number or each separate opening. Include all other pertinent hardware information.
 - 2. Make promptly, any corrections or changes necessary in schedules to comply with requirements; resubmit one reproducible and one copy of revised schedules. E. Templates for Fabrication:
 - 1. Forward templates for each type of detention equipment hardware required to fabricators of work in Sections noted above in 1.1.B following final review of hardware and keying schedules.
 - 2. Submit wiring diagrams for all electrical devices provided herein. F. Locking Device

Shop Drawings:

- 1. Indicate layout plans of each opening at 1/2"=1'-0" minimum scale, show anchorage and accessory items, dimensions and finishes. Note: Complete housing module plans can be drawn at 1/4"=1'-0" minimum, with typical enlarged plans.
 - 2. Indicate complete details of internal components of door locking and monitoring mechanisms located in transoms and jambs.
 - 3. Indicate permissible tolerances for each type.
- D. Closeout Submittals - Furnish three copies of Operating/Maintenance Manuals including parts lists for security locks and locking devices.

1.4. QUALITY ASSURANCE

- A. Throughout the specifications and drawings, types of materials may be specified by the manufacturer's name and catalog number in order to establish standards of quality and performance. If the bidder elects to substitute

any other products, he must request the Architect's approval in writing no later than ten (10) days prior to the bid date, and he must receive written approval by addendum. The following are requirements for approval for each type of product listed.

1. Manufacturers Qualifications: Provide security equipment products from manufacturers who have been actively engaged in the production of security equipment for a minimum of ten (10) years in successfully completing projects of equal scope and magnitude with products as herein specified. This evidence shall consist of a list of ten (10) projects that have been complete and operational for a minimum of five (5) years. The manufacturer shall now be actively engaged in the design and manufacture of security locks, locking devices, furnishings and miscellaneous security hardware and products. All locks, locking devices and related security hardware shall be provided by the same manufacturer.
 - a. For each facility, list name and location of installation, date of occupancy by Owner, Owner's representative to contact and telephone number, General Contractor, and Architect.
2. Two (2) copies of manufacturer's product specifications and catalog cut sheets and detail and performance data for each type product listed in this section.
3. Provide data substantiating that products being proposed for this project comply with the requirements stated herein.
4. List of projects under construction
5. List of completed projects
6. List of major suppliers
7. Security lock manufacture must have spare parts, locks and hardware available in a warehouse located within a two-hour drive to the facility. B.
8. Approved Detention Hardware Suppliers: Southern Folger - San Antonio, TX
9. Approved Southern Folger Certified Detention Equipment Contractor
 - a. Sustainable Security Solutions, Inc. - San Antonio, TX

1.5. PRODUCT HANDLING

- A. Comply with requirements of other Sections of these Specifications.
- B. For products delivered to door manufacturer and for products delivered to project site, package each item of hardware separately in containers, complete with necessary fasteners, installation instructions, and installation templates. Mark each container with item numbers, location of installation in accord with corresponding information shown on final hardware schedule.
- C. Store products at site to prevent damage or loss until installation is made.
- D. Control handling and installation of hardware products which are not immediately replaceable, so that the completion of work will not be delayed by hardware losses, both before and after installation.
- E. Deliver keys by secure carrier (hand carrier or registered mail) from manufacturer directly to authorized representative of the CM, as directed by the Architect. Include transmittal and forward copy of same to the Architect.

1.6. WARRANTY

- A. Comply with requirements of other Sections of these Specifications.

1.7. MAINTENANCE

- A. Fasteners and Accessories:
 1. Furnish five (5) percent extra fasteners and other miscellaneous accessories for installation.
- B. Furnish for institution use only:
 1. Special tools required for locking device and hardware maintenance (four complete sets).
 2. One lock repair kit
 3. Provide two (2) alignment tools for security locks.
 4. Three complete sets of keys

PART 2 PRODUCTS

2.1. SCREWS, FASTENERS, AND TOOLS

- A. Furnish exposed fasteners to match item fastened. Make fastener of the same metal as item fastened, except use plated brass or stainless steel for all aluminum items. Provide twenty (20) spares of each type of fastener used for anchoring hardware.
- B. Provide torx-head (star design with center pin) security fasteners for exposed fasteners on all security hardware, regardless of manufacturer. Furnish six (6) tool holders and six (6) bits for each different size screw. Holders and bits shall be left at project after installation and become property of the user.
- C. Provide two (2) alignment tools for medium security locks.

2.2. HINGES

- A. Heavy Duty 4-1/2 FM Stainless Steel 1.
Series/Manufacturer:
 - a. 204FMSS/Southern Steel 2.Description:
 - a. 4-1/2 x 4-1/2, 3/16 thick leaves minimum with 15/32" diameter x 2" long integral cast security studs
 - b. Cast 304 stainless steel leaves, non-removable steel pin, two concealed bearings, three knuckle with HT hospital tips
- 3. Hinges shall be finished US32, US32D or USP - primed, as called for in the hardware schedule
- 4. Provide quantities as follows:
 - a. Doors less than 5 ft high - 1 pair
 - b. Doors over 5 ft to 7 ft 6 in - 1-1/2 pair
 - c. Doors over 7 ft 6 in to 10 ft - 2 pair
 - d. Doors over 3 ft 8 in wide - 2 pair

2.3. SECURITY LOCKS

- A. Maximum Security - Electric Swinging Door Operators:
 - 1. Series/Manufacturer:
 - a. 10120AM/Southern Steel
 - 2. Frame mounted, 24 VDC motor operated.
 - 3. Internal switches monitor bolt status to show deadlocked and unlocked conditions.
 - 4. Bolt retracted manually by paracentric key.
 - 5. Six-lever tumbler keyed one side or both sides.
 - 6. Bolt remains retracted until door is opened.
 - 7. Lock operates in a fail secure mode.
 - 8. Bolt throw 1" flush when retracted.
 - 9. Galvanized case and cover
 - 10. U.L. listed for use on 3 hour fire door.
 - 11. Standard Functions:
 - a. Remote switch activates a motor which retracts the latchbolt. Latchbolt remains retracted until door is opened approximately 2", then it releases, automatically latches and deadlocks when the door is closed.

- b. Mechanical - Latchbolt is retracted by a mogul key at the door and remains retracted until door is opened approximately 2", then it releases, automatically latches and deadlocks when the door is closed. Automatic deadlatch feature is suspended when mogul key is rotated to mechanical key hold-back position. Normal function is resumed when key is returned to deadlocked position.

B. Medium Security - Mechanical Operation (Food Pass):

1. Series/Manufacturer:
 - a. 1010A/Southern Steel
2. Bolt retracted manually by paracentric key
3. Six Lever tumblers keyed one or two way
4. Reverse bolt bevel at food pass locations.
5. Automatic snaplatch
6. Galvanized case and cover C. Medium Security - Mechanical Operation 1.
 - Series/Manufacturer:
 - a. 1080A/Southern Steel
 2. Door mounted, dead bolt
 3. Bolt retracted manually by mogul key
 4. Six Lever tumblers keyed one or two way
 5. Supply with hollow metal lock mounting, escutcheon and security screws
 6. Provide keeper as scheduled
 7. Galvanized case and cover

2.4 DOOR POSITION SWITCH/CLOSER

A. Door Position Indicator Switches

1. Series/Manufacturer
 - a. 2215DPS Closer/LCN

2.5 FINISHES

	<u>U/S Symbol</u>	<u>ANSI Symbol</u>	<u>Description</u>
Hinges	US32D	630	Satin Stainless Steel
Locks & Pulls	US26D	626	Satin Chrome
Closers	AL	689	Aluminum Painted
Push,/Kick Plates	US32D	630	Satin Stainless Steel

2.6 CYLINDERS, KEYS AND KEYING:

- A. The security locks will incorporate three (3) separate keying systems; one for lever tumbler (Paracentric), one for pin tumbler (mogul cylinder) and one for commercial cylinder locks. Each keying system's keys shall be dye stamped for identification, corresponding to the hardware supplier's final schematic keying chart (See Paragraph D).
- B. Lever tumbler locks shall be keyed alike or different as directed. Provide cut keys as required.
- C. Mogul cylinder locks shall be master keyed as directed. Provide cut change keys, and master keys as required.
- D. A complete, detailed schematic chart of the keying system will be required. The hardware supplier will also be required to enter the key symbols for all doors on additional floor plans, which will be supplied by the Architect. Two (2) copies of the schematic keying chart and architectural floor plans shall be turned over to the user at the completion of the project. The cost for this service shall be included with the cost of materials at the time of bidding.

- E. Keys shall not leave the manufacturer's custody without prior arrangement for delivery and authorization from the Owner

2.7 DETENTION SPARE LOCKS AND LOCK PARTS:

- A. Shall be provided for the Owner's stock as follows:
 - 1. Locks - one of each type used (of both right or left handed operation, i.e. 1-right, 1-left).
 - 2. Door Position Switch (DPS) - two each type used
 - 3. Closer - Two of each type used (of both right or left handed operation, i.e. 2-right, 2-left)
 - 4. One complete set of security screwdrivers for all sizes of security screws used on this project.
 - 5. One repair parts list and assembly drawings bound in a manual for all detention products supplied in this division.

PART 3 EXECUTION

3.1. GENERAL

- A. Comply with requirements of other Sections of these Specifications.

3.2. INSTALLATION

- A. Comply with requirements of other Sections of these Specifications.
- B. All shipping of detention equipment hardware and coordination with other detention equipment shall be the responsibility of the DSC.

3.3. FIELD QUALITY CONTROL

- A. Comply with requirements of other Sections of these Specifications.

3.4. ADJUSTMENT AND REPAIRING

- A. Comply with requirements of other Sections of these Specifications.

3.5. PROTECTION AND CLEANING

- A. Comply with requirements of other Sections of these Specifications.

PART 4 HARDWARE SETS

The following hardware sets refer to hardware manufactured by Southern/Folger, San Antonio, Texas, unless noted otherwise. The products specified by the Manufacturer's number sets are the minimum acceptable standard of quality. Similar products of other manufactures that provide the same function have similar construction characteristics and design appearance may be acceptable but must be approved in writing by the Architects. Provide thresholds at all exterior doors.

DETENTION HARDWARE SET DH-1,

1 EA.	LOCK	SSCO #10120AMD-1 x RLHB x K1 x KEYED ONE SIDE x 24 VDC x MOTOR OPERATED x DEADLOCK INDICATION SWITCH x MECHANICAL LATCHBACK x FAIL SECURE x HALF CYCLE HOLDBACK x (1) US26D MOGUL CYLINDER x PC x GALV x TORX MS
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1 EA.	LOCK POCKET	SURFACE MOUNTED LOCK POCKET FOR WIDE JAMB LOCK
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END OF HARDWARE SETS

END OF SECTION

SECTION 09 21 16 — INTERIOR DRYWALL SYSTEMS

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 WORK INCLUDED

- A. Provide and install acoustical batt insulation within interior drywall partitions.
- B. Provide and install all interior drywall systems including light gauge metal studs and tracks, horizontal bridging, gypsum wall board and finishing systems, suspended gypsum board ceilings and soffits, furred gypsum board.
- C. Provide and install troweled firestopping system at drywall ceiling and wall penetrations at rated walls.
- D. Provide and install specified corner guards at each wall corner.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Painting
- B. Door frames
- C. Carpentry (wood blocking)
- D. Plaster on metal studs
- E. Mechanical, electrical and plumbing penetrations in rated drywall systems.

1.4 SUBMITTALS

- A. Submit manufacturer's product data describing all materials.
- B. Submit gypsum board finish schedule indicating level of finish proposed per each area. Finish levels shall be levels 1 through 4 as specified herein and defined by "Recommended Specification: Levels of

Gypsum Board Finish" as jointly published by AWCI, CISA, GA, and PDCA. Submit copy of publication with finish schedule.

- C. Submit manufacturers detail drawings and detailed installation methods for fire rated penetrations and filling of voids with specified firestopping system. Submit only those systems applicable to this project.
- D. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

1.5 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.
- B. Warranted defects shall include but not necessarily be limited to cracking, joint tape delamination or tearing, dimpling at fastener heads, bowing or warping of wall board, cracking at metal accessories, acoustical sealant failure.

1.6 DELIVERY, STORAGE AND HANDLING

- A. All materials shall be delivered in manufacturer's original packaging and stored flat in a covered, dry area providing protection from damage and exposure to the elements.
- B. Damaged or deteriorated materials shall be removed from the premises.
- C. During cold weather installation of gypsum panels and joint finishing, temperatures within the building shall be maintained within the range of 50 degrees to 80 degrees F. Adequate ventilation shall be provided to carry off excess moisture.
- D. Steel framing and related accessories shall be stored and handled in accordance with AISI's "Code of Standard Practice"

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- | | |
|---|---|
| <ul style="list-style-type: none">A. <u>Drywall Framing:</u><ul style="list-style-type: none">1. ClarkDietrich Building SystemsB. <u>Gypsum Board and Related Accessories:</u><ul style="list-style-type: none">1. United States Gypsum Co.2. National Gypsum Co.3. Georgia Pacific4. James HardieC. <u>Acoustical Batts:</u><ul style="list-style-type: none">1. Owens-Corning2. Certainteed3. Manville | <ul style="list-style-type: none">D. <u>Acoustical Sealant:</u><ul style="list-style-type: none">1. TREMCO2. Ohio Sealants, Inc.E. <u>Specialty Trims:</u><ul style="list-style-type: none">1. Fry Reglet Corp.2. MM Systems Corp.F. <u>Corner Guards:</u><ul style="list-style-type: none">1. American Specialties, Inc. |
|---|---|

2.2 FRAMING: Comply with ASTM C645-09 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C645-09 requirements for metal unless otherwise indicated.
 2. Protective coating: Comply with ASTM C645-09; roll formed from hot dipped galvanized steel; complying with ASTM A1003/A1003M and ASTM A653/A653M G40 (Z120) or having a coating that provides equivalent corrosion resistance. A40 galvanized products are not acceptable.
- A. METAL STUDS: 25 gauge galvanized roll formed, screw channel type studs with minimum 5/16 inch flanges and 1-1/4 inch legs. Provide widths of 1-5/8 inch, 2-1/2 inch, 3-5/8 inch, 4 inches and 6 inches as indicated in the drawings. Provide conduit punchouts at 24" o.c.
1. "EQ" (Equivalent Gauge Thickness) Steel Studs and Runners: Members that can show certified third party testing with gypsum board in accordance with ICC ES AC86-2010 (approved February 2010 Effective March 1, 2010) need not meet the minimum thickness limitation or minimum section properties set forth in ASTM C645-09.
 2. Non-structural Studs: Cold-formed galvanized steel C-studs, ClarkDietrich Building Systems Pro STUD drywall studs as per ASTM C645-09 for conditions indicated below:
 - a. Flange Size: 1 1/4 inch (32mm)
 - b. Web Depth: As specified on drawings, 1-5/8 inches (41 mm) 2-1/2 inches (64 mm) 3-5/8 inches (92 mm) 4 inches (102 mm) 6 inches (152 mm).
 - c. Member Description: ProSTUD 25 (25ga equivalent drywall stud) 70ksi Minimum Thickness: 0.0150 inches (0.3810mm) Minimum Design Thickness: 0.0158 inches (0.4013mm)
 - d. Member Description: ProSTUD 22 (22ga equivalent drywall stud) 70ksi Minimum Thickness: 0.0179 inches (0.4547mm) Minimum Design Thickness: 0.0188 inches (0.4775mm)
 - e. Member Description: ProSTUD 20 (20ga equivalent drywall stud) 65ksi Minimum Thickness: 0.0220 inches (0.5588mm) Minimum Design Thickness: 0.0232 inches (0.5893mm)
- B. RUNNER CHANNELS: Provide 25 gauge galvanized channels with minimum 1-1/4 inch flanges with hemmed edges, in widths to accommodate stud sizes.
1. Non structural Track: Cold-Formed galvanized steel runner tracks, ClarkDietrich Building Systems ProTRAK drywall track in conformance with ASTM C645-09 for conditions indicated below:
 - a. Flange Size: 1 1/4 inch (32mm)
 - b. Web Depth: Track web to match stud web size.
 - c. Minimum Material Thickness: Track thickness to match wall stud thickness or as per design.
- C. FURRING CHANNELS: Provide 20 gauge galvanized "hat" channels with face width of 1-1/4 inches, depth of 7/8 inches, and back Width of 2-9/16 inches minimum, hemmed edges.
- D. CEILING SUSPENSION: Provide 16 gauge galvanized channels, 3/4" x 1/2" and 11/2" or 2" x 17/32".
1. Firestop tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance rated assembly

indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

- a. Basis of Design Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems; MaxTrak or an equivalent product.

2.3 ACCESSORIES

- A. CORNER BEADS: 26 gauge galvanized beaded angle with 1-1/4" legs.
- B. Channel Bridging and Bracing: Steel, 0.0538-inch (1.37mm) minimum base metal thickness, with minimum 1/2 inch (13mm) wide flanges.
 - a. Basis of Design Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems; Spazzer 9200 Bridging and Spacing Bar, or an equivalent product.
 - b. Depth: As indicated on drawings, 7/8 inch by 7/8 inch by 50 inches.
 - c. Install at 48" o.c. horizontally.
2. Backing Plate: Proprietary fire-resistance treated blocking and bracing in width indicated.
 - a. Basis of Design Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems; Danback Fire-treated wood backing plate or an equivalent product.
- C. EDGE TRIM: 26 gauge galvanized steel "J" mould and angle with continuous bead. ClarkDietrich Building Systems 200.A and 200.B.
- D. WIRE: 9 gauge galvanized hanger wire and 16 gauge galvanized be wire.
- E. SCREWS: Bugel head Type "S" self tapping drywall screws in lengths recommended by wallboard manufacturer. USG "Super-Tite".
- F. CONTROL JOINTS: Roll formed zinc with 1/4" open joint, and perforated flanges. Provide with fireseal backing at rated systems. ClarkDietrich Building Systems No. 093.
- G. JOINT ADHESIVE: Premixed water based compound. USG taping joint compound.
- H. LAMINATING ADHESIVE: Durabond sheetrock setting-type for double-layer application and column fireproofing.
- I. JOINT REINFORCING: Center creased paper tape equal to "Perf-A-Tape".
- J. TROWELED FIRESTOPPING
 1. System Type: A combination of glass fiber or mineral wool insulation packing material with troweled-on application of sealing compound.
 2. Sealing Compound: Red tinted compound job mixed with water providing protection from heat (to temperatures of 1850 degrees F), smoke, toxic gas, fire and water. "Sta-Smooth FS 90 Fire-Shield Compound Fire and Smoke Stop" as manufactured by National Gypsum Co. or approved equivalent by Domtar Gypsum, Inc.
 3. Approvals:
 - a. Rated as noncombustible as defined by NFPA Standard 220 when tested in accordance with ASTM E 136 at Underwriters Laboratories.
 - b. Meet all requirements of ASTM E 814 and UL 1479: Fire tests of through penetration fire stops.
- K. CORNER GUARDS: Stainless steel surface mounted corner guards with beveled edge legs. 3" by 8' lengths, as manufactured by American Specialties, Inc.

2.4 WALLBOARD

- A. TYPICAL: 5/8" thick x 48" wide paper-faced gypsum panels, tapered long edges, lengths as required. U.L. listed and conforming to ASTM C-1396/C1396M-09a Standard Specification for Gypsum Board, Type X. USG fire code.
- B. WATER RESISTANT: 5/8" thick x 48" wide U.L. listed, Type X board with chemically treated face paper and water resistant gypsum core. Comply with ASTM C-1396/C1396M-09a Standard Specification for Gypsum Board.
- C. HIGH IMPACT: 5/8" thick x 48" wide, length as required. U.L. listed, "Fiberock Interior Panel Abuse Resistant" by USG or equal.

2.5 TILE BACKER BOARD

- A. 5/8" thick cement board formed of aggregated Portland cement slurry with polymer-coated, glass-fiber mesh. "Durock" as manufactured by United States Gypsum Co or approved equivalent.

PART 3 - EXECUTION

3.1 PARTITION INSTALLATION

- A. STUD SYSTEM ERECTION: Attach metal runners at floor and to structural elements with suitable fasteners spaced maximum 24" o.c. Position studs vertically, engaging floor track and runner at ceiling or structure. Place studs in direct contact with all door frame jambs, abutting partitions, partition corners and existing construction elements.
- B. Anchor all studs adjacent to door and window frames, partition intersections, and corners to ceiling and floor runner flanges. Securely anchor studs to jamb and head anchor clips of door or side-light frames by screw attachment. Over door and side-light frames, install horizontal runner with a web-flange bend at each end, and secure with one positive attachment per flange.
- C. Install diagonal stud bracing above ceiling at strike side of door jambs and at other locations as indicated in the drawings. Secure to structure.
- D. Follow stud manufacturer's recommendations for all framing construction and fastening.

3.2 WALL PANEL ERECTION

- A. Apply gypsum panels vertically or horizontally. Position all edges over studs for vertical application; all ends over studs for horizontal application. Use maximum practical lengths to eliminate end joints. Fit ends and edges closely together. Stagger joints on opposite side of partition.
- B. For single-layer vertical application of gypsum panels, space screws 12" o.c. in field of panels and 8" o.c. staggered along vertical abutting edges. For horizontal panel application, space screws 12" o.c. in field and along abutting end joints.
- C. For double-layer screw attachment, space screws 16" o.c. for both layers. Apply both layers of gypsum panels vertically with joints in face layer offset from base layer joints. For 5/8" panels, use 1" screws for base layer and 1-5/8" screws for face layers. For 1/2" panels, use 7/8" screws for base layer and 1-5/16" screws for face layer.

3.3 CHASE WALL ERECTION

- A. Align two parallel rows of floor and ceiling runners spaced as indicated in the drawings. Attach to concrete slabs with powder actuated anchors 24" o.c. and to suspended ceiling tees or structure with suitable fasteners 24" o.c.
- B. Position metal studs vertically in runners, 16" o.c., with flanges in the same direction and with studs on opposite sides of chase directly across from each other. Anchor all studs to floor and ceiling runner flanges with U.S.G. Metal Lock Fastener tool.
- C. Cut gypsum panel bracing to be placed between rows of studs, 12" high by chase wall width. Space braces 48" o.c. vertically and attach to stud webs with screw fasteners. 2-1/2" metal studs may be used in lieu of gypsum panels. Anchor web at each end of metal brace to stud web with two 3/8" pan head screws.

3.4 CEILING FRAMING

- A. GRILLAGE ERECTION: Space 8 gauge hanger wires 48" o.c. along carrying channels and within 6" of ends of carrying-channel runs. Wrap hanger around and through beams or joists. Install 1-1/2" carrying channels at 24" o.c. Position channels for proper ceiling height, level and secure with hanger wire saddle-bed along channel. Provide 1" clearance between runners and abutting walls and partitions. Secure furring to carrying channels with clips or saddle-tie to support. Overlap splices at least 8" and securely wire-tie each end with double-strand 16 gauge tie wire.
- B. Erect metal furring channels at right angles to 1-1/2" carrying channels or main support members Space furring (16") o.c. and within 6" of walls. Provide 1" clearance between furring ends and abutting walls and partitions. Secure furring to carrying channels with clips or saddle-tie to supports with double strand 16 gauge tie wire. Overlap splices at least 8" and securely wire-tie each end with double-strand 16 gauge tie wire.
- C. At light troffers or any openings that interrupt the carrying or furring channels, install additional cross reinforcing to restore lateral stability of grillage.
- D. At rated ceilings meet all requirements of selected U.L. Design No.
- E. METAL STUD CEILING FRAMING OPTION: Attach runners at ceiling height through gypsum panels to each partition stud with two screws. Insert metal studs in runners and attach each end with one 3/8" pan head screw. Install 1-5/8" stud cross-bracing over stud framing, space 48" o.c. and attach to each framing stud with two 3/8" pan head screws. At hangers, install 12" long stud section for box reinforcing or lap studs 12" and secure each end with two 3/8" pan head screws. At light troffers or any openings that interrupt the ceiling, install additional cross reinforcing to maintain structural integrity of framing.
- F. GYPSUM PANEL ERECTION: Apply gypsum panels of maximum practical length with long dimension at right angles to furring channels. Position end joints over channel web and stagger in adjacent rows. Fit ends and edges closely. Fasten panels to channels with 1", Type S screws, spaced 8" o.c. in field of panels and 8" along ends and edges.

3.5 EXTERIOR WALLS: Reference Section 05 41 00.

3.6 ACOUSTICAL BATTS

- A. Install unfaced full thickness acoustical fiberglass batts between studs at partitions as scheduled on the drawings. Fit batts tight to studs, tight to floor and head tracks and tight to one another. Batts shall run full height of partition unless indicated otherwise in the drawings.

3.7 ACOUSTICAL SEALANT

- A. Install continuous bead of sealant at bottom tracks at drywall partitions.
- B. Install vinyl foam double stick tape and sealant where head track terminates at ceiling.
- C. See drawings for additional locations.

3.8 ACCESSORY APPLICATION

- A. JOINT SYSTEM: Finish all face panel joints and corners with U.S.G. Joint System installed according to manufacturer's directions.
 - 1. Mix joint cement in strict accordance with manufacturers directions.
 - 2. Butter cement into joints filling them evenly and fully.
 - 3. Center tape and press down into cement leaving sufficient cement under tape for proper bond. Cover with thin coat of cement to fill recess between tape and board to bring material flush with surface.
 - 4. Face panels shall be cut fit around all wall outlets and switch boxes, utility lines, etc. All voids and cracks, occurring around all openings in board shall be taped and covered with joint cement.
- B. LAMINATING ADHESIVE: Spread to provide 1/2" adhesive beads 4-1/2" o.c. for full sheet lamination. For strip lamination, apply adhesive in vertical strips of four 1/2" beads, 1-1/2" to 2" o.c. Space strips 24" o.c.
- C. CORNER BEAD: Reinforce all vertical and horizontal exterior corners with corner bead fastened with 9/16" rosin-coated staples 9" o.c. on both flanges along entire length of bead.
- D. METAL TRIM: At exposed edges of board or where board terminates against other materials, apply metal trim over panel edge and fasten with screws.
- E. SCREWS: Power-drive at least 3/8" from edges or ends of panel to provide uniform dimple of 1/32" deep.
- F. CONTROL JOINTS: Cut panel at joint and back with double framing members. Attach control joint to face layer with 9/16" rosin-coated staples spaced 6" o.c. on both flanges along entire length of joint. At rated walls, provide fireseal behind joint. Provide joints at 25' maximum or as otherwise indicated in the drawings.
- G. CORNER GUARDS: Install as per manufacturer's recommendations.

3.9 TROWELED FIRESTOPPING:

- A. General: Install systems in complete accordance with manufacturers printed instructions and approved submittal for the required fire rating of the particular condition. Install firestopping systems at all penetrations and voids in all rated drywall ceilings and walls.
- B. Through-penetrations. Ensure that pipe, conduit, duct, cables or other penetration element is rigidly supported by drywall framing on both sides of wall or ceiling assembly. Oversize opening in wall board

to allow for required opening size and thickness of packing material in accordance with system and rating requirements. Install packing material in accordance with system requirements and compressed to allow for required thickness of sealing material. Trowel red-tint sealing material into void (same thickness as gypsum board) and smooth flush with both faces of drywall. Provide additional layer(s) of gypsum board around penetration where necessary to achieve required minimum thickness of sealing material.

- C. Void-filling: For voids such as intersection of walls and smooth or corrugated deck, pack void with compressed packing material and trowel red-tint sealing material into void (same thickness as gypsum board) and smooth flush with both faces of drywall. Provide additional layer(s) of gypsum board around penetration where necessary to achieve required minimum thickness of sealing material.
- 3.10 WOOD BLOCKING: Coordinate with project carpenter to ensure installation of fire retardant wood blocking between studs for mounting casework, millwork, toilet partitions, drinking fountains and other equipment.
- 3.11 FINISHING SCHEDULE: Follow published "Recommended Specification: Levels of Gypsum Board Finish" as follows:
- A. LEVEL 1 FINISH: At concealed areas above ceiling.
 - B. LEVEL 2 FINISH: At gypsum backing board to be covered with file or panels thicker than 1/4".
 - C. LEVEL 3 FINISH: At mechanical rooms, storage rooms, custodial and maintenance rooms, electrical and telephone closets.
 - D. LEVEL 4 FINISH: All other drywall areas scheduled for paint, fabric or vinyl wall covering.

END SECTION

SECTION 09 51 00 - ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 WORK INCLUDED

- A. Provide and install all lay-in acoustical ceiling panels and suspended grid system in accordance with the drawings and as specified herein.
- B. Provide and install light fixture protection at all rated ceilings.
- C. Provide and install hold-down clips where required for rated system.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Steel joists (spacing)
- B. Mechanical (air devices)
- C. Electrical (lighting fixtures)

1.4 DRAWING REFERENCES

- A. See drawings, finish schedule and Section 2.2 for ceiling types and ratings.

1.5 SUBMITTALS

- A. Submit manufacturer's product data describing all materials, finishes, ratings and installation requirements.
- B. Submit physical samples for each type of acoustical tile proposed.
- C. Submit physical samples for each type of grid proposed.
- D. Submit tile manufacturer's certification for whether hold-down clips are required for the selected tile(s) and rated system(s).
- E. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

1.6 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.
- B. Warranted defects shall include but not necessarily be limited to rusting or deflection of grid, deterioration or deflection of acoustical tiles.

1.7 QUALITY ASSURANCE

- A. Suspended acoustical ceiling contractor shall have a minimum of 3 years experience in the installation of specified systems for projects of similar size and scope of this project.
- B. Installation of acoustical tile and panels shall not begin until residual moisture from plaster, drywall, concrete or terrazzo work is dissipated. Before installation, the building shall be enclosed and permanent heating and cooling equipment in operation.

1.8 DELIVERY AND STORAGE OF MATERIALS

- A. Do not deliver materials to jobsite until spaces are ready for ceiling installation.
- B. All materials shall be delivered in manufacturer's original packaging and stored in an enclosed shelter providing protection from damage and exposure to the elements.
- C. Damaged, rusted or deteriorated materials shall be removed from the premises.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. TYPICAL CEILING PANELS:
 - 1. Armstrong World Industries, Inc.
 - 2. USG Interiors, Inc.
- B. SPECIALTY CEILING PANELS
 - 1. Acoustical Resources, Inc.
 - 2. Wenger
 - 3. U.S.G.
- C. GRID SYSTEMS:
 - 1. Armstrong World Industries, Inc.
 - 2. USG Interiors, Inc.
 - 3. Chicago Metallic Corp.

2.2 MATERIALS:

- A. TYPICAL CEILING PANELS:
 - 1. 24" x 24" x 5/8" white **“Cortega Square Lay-in” No. 770**, square-edged as manufactured by Armstrong or equivalent (color, pattern, texture) by specified manufacturer. **Non-rated system.**

2. 24" x 24" x 5/8" white "**Cortega Square Lay-In" No. 824** square-edged as manufactured by Armstrong or equivalent (color, pattern, texture) by specified manufacturer. **Fire-rated system.**

B. SUSPENSION SYSTEM:

1. Components shall be formed from commercial quality cold-rolled steel, electro-galvanized, 2'x2' module.
2. The suspension system shall support the ceiling assembly with a maximum deflection of 1/360 of the span per A.S.T.M. C-635-69.
3. Main tee with double web design 1-1/2" high and rectangular bulb; 15/16" exposed flange with rolled cap; cross tee holes at 6" o.c.
4. Four foot cross tee 1-1/2" high with double web design. Rectangular bulb joining main runners at 2' on center.
5. Two foot cross tees perpendicular to 4' cross tees. Two foot cross tees minimum of 1-1/2" high, No. CMC 222-41 or equivalent by specified manufacturer.
6. Wall molding - hemmed edge, electro-galvanized cold rolled steel with equal leg width, finish to match grid.
7. Finish: Typical finish, factory white painted steel. At high humidity areas including kitchens, dressing rooms, toilet rooms provide factory white painted aluminum cap.
8. Rating: Provide U.L. listed grid for scheduled system rating.

PART 3 – EXECUTION

3.1 COORDINATION

- A. Verify that above ceiling work, including fire dampers, ductwork, piping, wiring and insulation is complete and approved prior to beginning ceiling work.

3.2 INSTALLATION

- A. Ceiling systems shall be suspended from structural members by 12 gauge annealed wire; spacing as recommended by manufacturer. Provide additional support for light fixtures and grilles at each corner. Provide secondary support framing ("Unistrut") where spacing of structural members exceeds suspension system manufacturer's recommendations.
- B. Acoustical lay-in panels shall be installed in strict accordance with the manufacturer's instructions. Tile shall be installed with fissures or pattern all in same direction.
- C. Provide additional hangers at ceiling suspended items including projection screens, speakers, exit lights, air supply and return grilles.
- D. Space main runner hangers a maximum of 6 inches from wall. Do not support systems from wall.
- E. Adjust hangers to ensure level ceiling in plane.

3.3 RATED CEILINGS

- A. Provide specified ceilings in fire rated assembly. Protect light fixture protection in accordance with approved U.L. Design to meet required assembly rating. Provide additional hangers to meet the requirements of the particular U.L. rating.
- B. Ceiling system manufacturers not listed in the required U.L. design number (reference drawings) shall be responsible for determining whether their rated system is acceptable to the particular local code authority.
- C. For ceiling tiles weighing 1 lb. per square foot or more, verify no requirement for hold-down clips at rated systems.

3.4 CLEANING AND REPLACEMENT

- A. At completion, replace file unit and grid systems that are damaged. Clean or replace tile and grid systems that cannot be cleaned.
- B. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Furnish quantity not less than 5 percent for each color, pattern, and type of ceiling tile installed.

END OF SECTION

SECTION 09 91 00 – PAINTING AND FINISHING

PART 1 - GENERAL

1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

1.2 WORK INCLUDED

- A. Provide all labor, materials, and equipment required for all painting, staining and finishing as indicated in the drawings, the approved submittals, and as specified herein. Painted or stained systems include but are not necessarily limited to the items listed below:
- B. EXTERIOR SYSTEMS:
 - 1. All visible wood unless noted otherwise.
 - 2. All ferrous metal. All galvanized metal unless noted otherwise. Touch-up on welds or damaged finishes.
 - 3. Exposed conduit, piping, etc., except for roof mounted piping not visible.
 - 4. Exposed roof mounted equipment visible from ground level or from upper floors of the building.
 - 5. All exposed concrete masonry units.
 - 6. All items normally painted in accordance with good construction practice.
- C. INTERIOR SYSTEMS:
 - 1. All visible wood or behind cabinet doors unless noted otherwise.
 - 2. All ferrous metal. All galvanized metal unless noted otherwise. Touch-up on welds or damaged finishes. Structural steel, steel joists and deck exposed to view except in mechanical rooms.
 - 3. Exposed conduit, piping, outlet boxes, raceways, and panel boxes except galvanized or aluminum piping located in mechanical or electrical rooms.
 - 4. All exposed concrete masonry units, gypsum board and plaster unless otherwise noted.
 - 5. All factory-primed hardware. Back-priming of all wood trim, millwork or finished carpentry prior to installation.
 - 6. All hollow metal doors and frames.
 - 7. All items normally painted in accordance with good construction practice.
 - 8. All unfinished louvers and grilles.

1.3 WORK TYPICALLY EXCLUDED

- A. Shop applied primer on structural steel and miscellaneous metals items.
 - B. Aluminum frames, doors, and windows.
 - C. Plastic clad casework, millwork, and wall panels.
 - D. Factory finished equipment unless noted otherwise (provide job touch-up).
- 1.4 DRAWING REFERENCE: Reference any paint or finish notes in the drawings for any pre-selected colors or other requirements.
- 1.5 SUBMITTALS
- A. Submit manufacturer's product data describing each proposed type of paint, sealer, stain, or coating and its recommended use. Include viscosity and percent solids information. Where not the specified base manufacturer, list the specified brand name and type and the proposed substitute. The Architect shall be the sole judge as to equivalency of systems.
 - B. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.
- 1.6 WARRANTY
- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of two years after the date of Substantial Completion of the project.
 - B. Warranted defects shall include but not necessarily be limited to peeling, crazing, cracking, blistering, mildewing, chalking or dusting, pin holes, color fade or loss of hardness or sheen.
- 1.7 QUALITY ASSURANCE
- A. Painting contractor shall have a minimum of 5 years experience in the application of the specified systems for projects of similar size and scope as this project.
 - B. If requested by the Architect, provide system manufacturer's certification of the proposed painting contractor as approved for application of the product.
- 1.8 DELIVERY, STORAGE AND HANDLING
- A. Do not deliver painting materials to the jobsite until spaces and surfaces are ready for painting.
 - B. Deliver materials in manufacturer's original containers, unopened except for shop mixing of colors. Containers shall bear manufacturer's readable labels indicating brand and type of paint. Any additional containers with labels indicating products not approved shall be removed from the jobsite. Any applied material not previously approved by the Architect is subject to removal and reapplication with the appropriate approved product.
 - C. Store materials in environmentally controlled area. Interior products shall be acclimated to a temperature range of 50-80 degrees F. at least 24 hours prior to application.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. TYPICAL PAINTS: Systems are based on the first listed manufacturer. Only equivalent systems provided by specified manufacturers in accordance with attached Product Comparison sheet and as approved by the Architect are approved for use.
1. Sherwin Williams, Inc.
 2. Pittsburgh Paints
 3. Pratt & Lambert
 4. Benjamin Moore Co.
- B. SPECIALTY PAINTS:
1. Epoxies: Sherwin Williams, PPG, Pratt & Lambert.
- C. SUBSTITUTIONS: In accordance with Section 01 25 00 Substitution Procedures.

2.2 INTERIOR SYSTEMS

- A. SYSTEM TYPES FOR NEW WALLS (Unless indicated otherwise on Finish Schedule or drawings):
1. Drywall in toilet rooms, storage rooms, and mechanical/electrical/toilet rooms/ classrooms: **Semi Gloss Enamel** at walls and ceilings.
 2. Drywall soffits: **Eggshell Enamel**.
 3. Typical masonry (CMU): **Gloss Enamel**.
 4. Masonry (CMU) in toilet rooms: **Gloss Epoxy**.
 5. Steel railings: **Gloss Aliphatic Urethane**.
 6. Suspended rigging over stage: **Dry Fog**.
- B. SYSTEM DESCRIPTIONS (Reference item 3.3 for modifications and preparation required for these systems when applied to existing walls already painted):
1. Primer on gypsum board: SW PrepRite High Build Primer B28W601 – one coat over light to medium texture (submit texture sample for approval)
 2. Eggshell Enamel on Drywall: SW Pro Mar 400 Latex Eg-Shel B20W4400 – one coat over specified primer.
 3. Semi-Gloss Enamel on Drywall: SW Pro Mar 400 Latex Semi Gloss B31W4400 - one coat over specified primer.
 4. Epoxy Paint on Drywall: One coat SW PrepRite 200 Latex Primer B28W200 over specified primer.
 5. Gloss Enamel on Drywall: Two coats SW Water Based Catalyzed Epoxy B70 Series gloss acrylic over specified primer.
 6. Semi-Gloss Enamel on shop-primed metals: SW Water Based Industrial Enamel B53-300 acrylic gloss Enamel – two coats.
 7. Natural Finish on Wood: SW Sherwood BAC Wiping Stain (one coat) + SW Wood Classics Sanding Sealer B26V3 (one coat) + SW Wood Classics Satin Varnish A66.
 8. Clear Finish on Wood: SW Wood Classics Polyurethane Varnish A67 (two coats). Sand lightly between all coats.
 9. Block Filler: SW Prep Rite Block Filler B25W25 (for areas not subject to moisture); SW Heavy Duty Block Filler (for areas subject to moisture). Provide 2 coats as specified under “Execution”.

10. Gloss Enamel on CMU or concrete: Two coats block filler plus two coats SW Water based Industrial Enamel gloss acrylic latex over specified primer.
11. Semi-Gloss Enamel on CMU or concrete: Two coats block filler plus two coats SW Water Based Industrial Enamel semi-gloss acrylic latex over specified primer.
12. Semi-Gloss Epoxy Paint on concrete: One coat SW Water Based Epoxy semi-gloss over cured concrete plus finish coat of SW Water Based Epoxy semi-gloss. Minimum paint thickness 3.0 dry mils.
13. Gloss Epoxy Paint on CMU: Two coats block filler (unless surface-bonded) plus finish coat of gloss. Minimum paint thickness 3.0 dry mils.
14. Gloss Epoxy Paint on concrete: One coat SW Water Based Epoxy gloss over cured concrete plus finish coat of SW Water Based Epoxy gloss. Minimum paint thickness 3.0 dry mils.
15. Semi-Gloss Enamel on utility piping and galvanized metals: SW Pro-Cryl Universal Metal Primer – one coat + SW DTM Acrylic Semi Gloss – two coats.
16. Semi-Gloss Epoxy Paint on CMU: Two coats block filler plus finish coat of SW Water Based Epoxy semi-gloss. Minimum paint thickness 3.0 dry mils.
17. Gloss Aliphatic Urethane Enamel on primed steel railings: Over epoxy shop primer apply two coats SW Hydrogloss Single Component Water Based Urethane B65-181 Urethane Gloss Enamel using airless spray equipment.
18. Dry Fall Acrylic (exposed deck, structure and rigging): One coat SW Super Save Lite Acrylic Dry Fall Eggshell Primer & Finish. Black color. Overspray dries to non-adhering dust in a ten foot fall.

2.3 EXTERIOR SYSTEMS

A. SYSTEM TYPES:

1. Exterior Metals: **Gloss Enamel.**
2. Field welds: **Zinc-Rich Coating.**

B. SYSTEM DESCRIPTION:

1. Gloss Enamel on Galvanized Metals: SW Pro-Cryl Universal Metal Primer B66W310 (one coat) + SW Sher-Cryl HPA B66-300 enamel – two coats.
2. Block Filler on CMU: SW Heavy Duty Block Filler B24W46, one coat.
3. Gloss Enamel on Shop-Primed Metals: SW Sher-Cryl HPA B66-300 gloss enamel-two coats.
4. Gloss Enamel on Aluminum: SW Pro-Cryl Universal Metal Primer B66W310 – (one coat) + SW Sher-Cryl HPA B66-300 gloss enamel – two coats.
5. Field Welds: “ZRC” cold-applied galvanizing.

PART 3 - EXECUTION

3.1 PREPARATION

- A. METALS: Remove grease, oil, and dirt. Touch-up any damaged primer with like material. Remove any welding tags and grind smooth before painting. Fill any open galvanizing ports.
- B. PLASTER, CMU, CONCRETE: Remove dusting and mortar residue. Remove any efflorescence and seal. Ensure that plaster, concrete and mortar joints are dry and fully cured.

3.2 APPLICATION

- A. GENERAL: All paint and finishes be brushed or sprayed in even, uniform coats without runs or sags. Allow each coat to dry completely before applying succeeding coats. All surfaces shall be dry and no painting shall be done in damp conditions or when the ambient temperature is below 50 degrees F.
- B. WOOD DOORS: Factory sealed tops, bottoms, and edges of plastic laminate surfaced doors left undisturbed require no additional finishing. Reseal any job cuts. Paint metal glazing stops.
- C. MECHANICAL/ELECTRICAL EQUIPMENT: Painting contractor shall examine the mechanical and electrical drawings to determine quantities and locations of exposed piping, louvers not shown in Architectural drawings, electrical and telephone panels in finished areas, exposed electrical conduit in finished areas.
- D. BLOCK FILLER AT CMU: Apply **first coat** of filler to ensure penetration into voids and work into block texture with bristle brush. Follow with a **minimum of one additional coat**. Provide uniform finish with no pinholes.
- E. DRYWALL: Paint finish, sheen and texture shall be uniform and match the samples submitted to and approved by the Architect.

3.3 PREPARATION OF EXISTING PAINTED SURFACES

- A. Maintenance painting will frequently not permit or require complete removal of all old coatings prior to repainting. However, all surface contamination such as oil, grease. Loose paint, mill scale dirt, foreign matter, rust, mold, mildew, mortar, efflorescence, and sealers must be removed to assure sound bonding to the tightly adhering old paint. Glossy surfaces of old paint films must be clean and dull before repainting. Thoroughly washing with an abrasive cleanser will clean and dull in one operation, or, wash thoroughly and dull by sanding. Spot prime any bare areas with an appropriate primer. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system. Check for compatibility by applying a test patch of the recommended coating system, covering at least 2 to 3 square feet. Allow to dry one week before testing adhesion per ASTM D3359. If the coating system is incompatible, complete removal is required.

PART 4 – SCHEDULES

4.1 COLOR SELECTIONS

- A. SCHEDULE: Unless colors are pre-selected in the Bidding Documents, the Architect shall prepare color schedule for the project using colors selected from the approved paint manufacturer(s). Where colors are pre-selected, the painting contractor shall use the colors selected or submit a schedule of proposed exact color matches by one of the specified paint manufacturers. **Provide 12” x 12” samples of actual paint for each color** whether pre-selected color or proposed color match.
- B. DOCUMENTATION: Upon completion of the Project, painting contractor shall furnish to the Architect a complete schedule of paint brands, types, and colors actually used for each room and area.

4.2 EXTRA MATERIALS

- B. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Furnish quantity not less than 5 percent for each color (field and accent) of paint used.

END OF SECTION

SECTION 10 14 00 — GRAPHICS AND SIGNAGE

PART 1 - GENERAL

1.1 COORDINATION:

- A. The General Conditions of the Contractor for Construction and the Supplementary Conditions to the General Conditions of the Contract for the Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addendum issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the stringent requirements and the greater quantity shall apply.

1.2 WORK INCLUDED

- A. Material and installation for the Plastic Room Identification Plaques.
- B. Material and Installation for Exterior/Interior Building Identification Letters.
- C. Material and Installation For Building Dedication Plaque with logos (including but not limited to conversion of architectural drawings into useable vector line art format).

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Interior wall materials and finishes.
- B. Exterior wall materials and finishes.
- C. Typical handicapped site signage.

1.4 SUBMITTALS

- A. Submit manufacturer's product data describing materials, and mounting methods for Room Identification Plaques, Exterior/Interior Building Identification Letters, and Building Dedication Plaque.
- B. Submit color samples of actual material for color and finish selection by Architect.
- C. Submit finished sample of room identification plaque(s) with any required symbols other than text.
- D. Submit paper "rubbing" of final layout of Building Dedication Plaque for Architect's approval.
- E. Submit full size paper layout of Exterior Building Identification Letters for each line of text.
- F. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

1.5 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.
- B. Warranted defects shall include but not necessarily be limited to color fading, delamination, failure of anchoring or fastening, cracking, breaking or tarnishing.
- C. Exterior signage or building letters contributing to streaking or staining of building shall be a defect to be corrected by the Contractor, with building materials cleaned or replaced as required.

1.6 QUALITY ASSURANCE

- A. Fabrication and installation company shall have a minimum of 3 years experience in the installation of similar systems for projects of similar size and scope.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver materials to the jobsite until surfaces are ready for installation of graphics.
- B. Store materials in covered, dry, temperature and humidity controlled space.

2 PART TWO – PRODUCTS

2.1 MANUFACTURERS

- A. ROOM IDENTIFICATION PLAQUES:
 - 1. Corpus Christi Stamp Works
 - 2. Sign International
 - 3. Multi-Graphics Incorporated
- B. EXTERIOR BUILDING IDENTIFICATION LETTERS:
 - 1. A.R.K. Ramos
 - 2. Gemini Inc.
 - 3. Matthews Architectural Products
 - 4. Sign International
- C. BUILDING DEDICATION PLAQUE:
 - 1. A.R.K. Ramos
 - 2. Matthews Architectural Products
 - 3. The Southwell Co.
 - 4. Sign International

2.2 MATERIALS

- A. ROOM IDENTIFICATION PLAQUES:
 - 1. 6" X 9" X 1/4" thick two tone series:
 - 2. Fabrication: Constructed of Wilson Art face laminate (as selected by the Architect from manufacturer's standard selections) laminated to a solid acrylic core. The raised 1/32" acrylic copy

shall be cut through the laminate face color and chemically welded to the acrylic core to assure permanent attachment, including the symbols. Any lower and secondary copy shall be 5/8" high Helvetica Medium (all caps) incised copy paint filled. Colors as selected by the Architect. Any secondary copy shall be 8-stroke computer engraved. Rounded corner letters will not be acceptable. The edge of the signs shall be finished to match the face laminate color-to-color as selected by the Architect.

3. At toilet rooms also provide with 2" high raised gender and wheelchair symbols when handicapped equipped noted on schedule. Symbols shall be chemically welded through the face laminate to the acrylic core. Edges painted a color as selected.
4. The raised copy shall be accompanied with grade 2 Braille by means of Visi Touch DuraDot Braille manufacturing system. The clear Glass DuraDot shall have a 0.059 surface diameter and raised 1/32" above the face laminate and shall be unitized to the acrylic core through the face laminate. The edges of the sign shall be finished to match the face laminate color-to-color as selected by the Architect. Any secondary copy shall be 8-stroke computer engraved. Rounded corner letters will not be acceptable.
5. Installed plaques shall comply with all state, local, and federal requirements for compliance.

B. EXTERIOR BUILDING IDENTIFICATION LETTERS

1. Scope: The project shall include a cast letters as described below, to be provided and installed by contractor. Letterstyle, finish and mounting to be selected by Architect.
2. Fabrication of Letters: Fabricate letters to comply with requirements indicated below and as indicated on drawings.
 - A. Cut letters : Form letters by cutting from solid sheet material of thickness specified. Produce characters with smooth flat faces, sharp corners, precisely formed lines and profiles, free from pits, scale, sand holes and other defects. Supply anchoring devices on reverse side of individual letters as required.
3. Characteristics:
 - A. Metal: Aluminum
 - B. Size: 6 inches unless noted otherwise on drawings.
 - C. Thickness: 1 1/2 inches.
 - D. Letterstyle: Sans Serif
 - E. Finish: As selected by Architect from manufacturer's finish options (submit samples).
 - F. Mounting: Concealed (refer to drawings for wall type).
 - G. Text: " "
4. Template: Provide full size paper mounting template showing hole placement and location of mounting holes.
5. Finishes: Colors and surface textures for exposed letters as selected by the architect from the manufacturer's standard and **premium** selections.

C. BUILDING IDENTIFICATION PLAQUE:

1. 18" wide X 24" high cast bronze alloy plaque. Borders and raised text shall have satin finish. Background shall receive a dark oxidized leatherette finish. Faces and edges to be chemically cleaned and sprayed with two coats of clear acrylic lacquer.
2. Provide threaded stainless steel or brass studs on back for concealed mounting with epoxy. Letter style "Helvetica Medium" per A.R. Ramos or equivalent by specified manufacturer.

3. Layout, logos and letter sizes to be provided by the Architect. General contractor shall perform all conversions of architectural drawings & logos into useable vector line art format or any other type of format as required in order to produce the building plaque layout as provided by the Architect.

3 PART THREE- EXECUTION

3.1 INSPECTION AND PREPARATION

- A. Ensure that wall surfaces are completed and accepted by the Architect prior to installing wall-mounted items or painted wall graphics.
- B. Obtain approved location schedule for Room Identification Plaques prior to delivery of plaques to the jobsite.

3.2 INSTALLATION

A. ROOM IDENTIFICATION PLAQUES:

1. Apply top and bottom strips of 1/8" thick double stick vinyl foam tape and backs of each plaque. Apply liberal amount of clear silicone rubber adhesive to a minimum of 50% coverage of back of plaque.
2. Plaques shall be mounted to the strike side of the door on the wall within 5' of the floor and 6" max. from the jamb; when location is on a glass side light or window, mount with a solid color back-up plate to cover reverse side of the glass. Attachment shall be with foam tape and silicone.

B. BUILDING DIRECTIONALS SIGNS:

1. Apply top and bottom strips 1/8" thick double stick vinyl foam tape on backs of each sign. Apply liberal amount of clear silicone rubber adhesive to a minimum of 50% coverage of back of sign.
2. Signs shall be mounted to the strike side of the door on the wall within 5' of the floor and 6" max. from the jamb; when location is a glass sidelight or window, mount with a solid color back-up plate to cover reverse side of the glass. Attachment shall be with foam tape and silicone.

C. EXTERIOR/INTERIOR BUILDING IDENTIFICATION LETTERS.

1. Pre-drill holes into masonry and insert threaded stud on back of letters into epoxy adhesive filled holes. Provide stainless steel spacers to set letters off wall 1/2" minimum 2 studs per letter. Refer to drawings for wall finish type.

D. BUILDING IDENTIFICATION PLAQUE:

1. Masonry Wall: Pre-drill holes into masonry walls and insert threaded studs on back of letters into epoxy adhesive filled holes. Mount plaque tight against wall.
2. Drywall: Mount plaque using a minimum of 4 moly type expansion screws and silicone adhesive. Mount plaque tight against wall.

END OF SECTION

SECTION 280120 - TOUCH SCREEN SYSTEM

PART 1 - GENERAL

1.01 SUMMARY.

- A. Provide Touch Screen control stations as specified herein and as shown on the schedules and drawings. Contractor shall receive, place, connect, and mount all equipment specified in this Section per the manufacturer's instructions. Contractor shall furnish all hardware, wire, connectors, and other necessary items as required for a complete and functional control system.
- B. Related Sections:
 - 1. Section 11190 Detention Equipment
 - 2. Section 08710 Door Hardware
 - 3. Section 260000 Electrical
 - 4. Section 280000 Security Electronics, General
 - 5. Section 280140 Programmable Logic Controllers
 - 6. Section 280150 Electronic Relay System
 - 7. Section 280200 Intercommunications System
 - 8. Section 280300 Closed Circuit Television System

1.02 ACCEPTABLE INTEGRATORS

- A. Except as otherwise specified, herein, or in the General Conditions, the equipment and materials of this Section shall be products of the following manufacturers, subject to compliance with specification requirements and provided each specifications. Integrators and their products that utilize proprietary or custom software are not acceptable.
 - 1. Icotech, - Montgomery, AL
 - 2. Sustainable Security Solutions - San Antonio, TX

1.03 REFERENCES.

- A. The General Conditions, Supplementary Conditions, and Division 1 Specifications shall apply to all work of this section.
- B. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- C. Underwriter's Laboratories (UL)
 - 1. UL 508 Industrial Control Equipment
 - 2. NEC National Electrical Code (latest edition)

1.04 WORK INCLUDED

- A. Provide materials, labor, equipment, and services necessary to furnish, deliver, and install a touch screen control system as shown on the drawings, as specified herein, and/or as required by job conditions.
- B. Major Sub-systems include:
 - 1. Touch Screen Control Stations.
 - 2. Programmable Logic Controllers (PLC's).
 - 3. Electronic relay system.

1.05 COORDINATION WITH OTHER TRADES

- A. The Contractor shall coordinate the work of this Section with that of other Sections as required ensuring that the entire work of this Project will be carried out in an orderly, complete and coordinated fashion.
- B. Coordinate with specific hardware used by Division 8 and Division 11 Contractors for builders hardware and security hardware.
- C. Division 28 responsibilities for electro-mechanical locks and devices Shall include the following:
 - 1. Division 28 shall provide relay cabinets in each equipment room as shown on the drawings to interface to the door locks, door status switches, and jam mounted push-buttons and key switches. Relay cabinet

- and associated terminal strips shall be sized as required to accommodate control equipment for specified lock functions.
2. Division 28 contractor shall be responsible for furnishing and installing all equipment, wiring, installation and testing of systems defined in Division 28. The sub-contracting of Division 28 equipment installation shall not be acceptable. The Division 28 contractor shall be responsible for the design, fabrication, project management, installation and warranty of all systems within this division of work.
 3. Provide all control hardware and systems to control or monitor a door in accordance with the requirements of Division 28 and the wiring diagrams provided by Division 8 and Division 11.
 4. For doors which include hardware furnished and installed by the Division 8 Contractor and requires Division 28 devices and functional control such as doors equipped with card readers intercoms, push buttons, and other control devices; the Division 28 Contractor shall furnish and install conductors, and cabling systems to support all door functions.
 5. After installation, verify proper control operation of all doors.
 6. Division 28 shall be responsible for coordination of all interfaces with Division 16 for any lighting or power controls interface that may be required from the Division 28 control Systems.
 7. Division 28 shall be responsible for coordinating with Division 16 the exact locations and requirements for electrical power provided to the security equipments.
 8. Division 28 shall be responsible for ensuring that all security system equipment is powered from an emergency power panel and that all Division 28 systems, except where otherwise noted, are powered from an uninterruptible power system (UPS).
- D. Division 11 responsibilities for electro-mechanical locks and devices shall include the following:
1. Furnish and install door locks, door position switches, limit switches, lock feature switches and push buttons and key switches, as required for the system to perform the functions as defined herein.
 2. Division 11 furnished and installed hardware shall be installed and prepped complete including lock and switch pigtails being stripped and ready for termination by the Division 28 contractor.
 3. Furnish wiring drawings and other information as required for design and installation of the control drawings.
 4. Solenoids for direct current (DC) application shall be equipped with diodes for transient protection.
 5. After installation, adjust all locks and switches for proper indication and mechanical alignment.
 6. Hollow metal frames shall be provided with boxes or pockets as required to accommodate door position switches, locks, key switches and/or push buttons.
 7. Hollow metal frames shall have provided interconnecting conduit between the door position switch and the lock pocket and a conduit stubbed from the lock pocket to the top and/or bottom of the frame. Conduits shall have a pull string installed.
- E. Division 8 responsibilities for electro-mechanical locks and devices shall include the following:
1. Furnish and install door locks, door position switches, limit switches, lock feature switches and push buttons and key switches, as required for the system to perform the functions as defined herein.
 2. Division 8 furnished and installed hardware shall be installed and prepped complete including lock and switch pigtails being stripped and ready for termination by the Division 28 contractor.
 3. Furnish wiring drawings and other information as required for design and installation of the control drawings.
 4. Solenoids for direct current (DC) application shall be equipped with diodes for transient protection.
 5. After installation, adjust all locks and switches for proper indication and mechanical alignment.
 6. Hollow metal frames shall be provided with boxes or pockets as required to accommodate door position switches, locks, key switches and/or push buttons.
 7. Hollow metal frames shall have provided interconnecting conduit between the door position switch and the lock pocket and a conduit stubbed from the lock pocket to the top and/or bottom of the frame. Conduits shall have a pull string installed.

1.06 SUBMITTALS

A. General

1. Submittals shall be made in accordance with the General Provisions (Section 280000) of these specifications.

B. Specific Requirements:

1. Submit catalog cuts for all equipment and devices being furnished under this Section.
 2. Submit full scale color drawings for each control screen which shall designate colors and icons for each controlled and/or monitored condition within the system.
 3. Submit electronic files from which each screen may be viewed to reflect selected colors and icons. Software shall be provided to allow the Engineer and Owner to view the screens.
- C. Software development
1. Within one (1) month of receiving the approved shop drawing submittal, the security equipment contractor shall schedule a preliminary meeting with the owner and architect/engineer. Specific operation and function of the security control system must be determined prior to the preliminary meeting. Extensive analysis outlining all performance of software design and application will be determined and approved at the preliminary meeting.
 2. Based on the preliminary meeting, the Division 28 contractor shall develop the control and display software. The complete set of control screens shall be submitted as shop drawings.
 3. Any changes or modifications to the system resulting from the shop drawings shall be incorporated into the system and demonstrated at a meeting to finalize the system.
 4. Any modifications to the system resulting from the meeting will be incorporated and demonstrated at the factory testing.
- D. Factory Testing
1. The contractor shall give written notice that the system is ready to be tested a minimum of 14 days prior to testing.

1.07 TOUCH SCREEN SYSTEM DESCRIPTION

- A. Touch Screen control stations provide the human interface device at locations as shown on the drawings for security alarm monitoring and control of security devices including doors, cameras, and intercoms.
- B. The Touch Screen control stations are comprised of a Pentium based PC, LCD monitor with touch screen transducer. The control icons serve as a means of interface to the programmable logic controller (PLC). The PLC then performs logic functions (such as timing and interlocking) and activates the appropriate field devices (such as locks or video Switcher control) based on the graphic control panel switch command.
- C. Monitoring functions: The PLC receives signals from field devices and routes the information to the Touch Screen control stations where icons and/or audible tones annunciate the condition of the controlled field devices.
- D. The touch screen terminal consists of a 32" high-resolution LCD color video monitor integrated with a touch screen transducer which is applied to the monitor surface. Touch screens shall be freestanding or rack mounted in casework as indicated on the drawings. Freestanding monitors shall have adjustable swivel bases secured to the casework.
- E. Log-In: Access to the touch screen system shall be password protected and all operators shall log into the system. All log-in/log-out activities shall be recorded on the system data logger.
- F. Mouse: Each touch screen station shall also be equipped with a mouse to operate the terminal using an on-screen indicator rather than by using the touch of a finger.
- G. Control Transfer: Two methods of control/transfer for Intercom shall be provided:
1. Substation Transfer: Activating the "Log Off" icon on the touch screen monitors shall automatically transfer all control and indicating functions to the designated location. When logged off, the transferred terminal shall not be capable of performing control functions. Return to normal operation shall be accomplished by logging onto the system using the on-screen keypad.
 2. Control "Takeover": Activating the "Takeover" icon on the touch screen monitor shall automatically transfer all control and indicating functions to the designated location. When logged off, the transferred terminal shall not be capable of performing control functions. Return to normal operation shall be accomplished by logging onto the system using the on-screen keypad.
- H. Failure of any touch screen or network PC shall not affect the operation of any other touch screen station. Touch screen control stations shall communicate directly with the PLC's for control functions via the security Ethernet LAN. PLC's shall be located in equipment rooms as shown on the drawings.
- I. Each Touch Screen control station shall contain a licensed copy of the Graphical User Interface Software (GUI). The use of server based systems shall be strictly prohibited. All copies of licenses shall be turned over to the owner at the time of substantial completion of the project and become the sole property of the owner.

1.08 TOUCHSCREEN SYSTEM – SCREEN CONTROLS/MONITORING FUNCTIONS – GENERAL:

- A. General: Control screens shall be comprised of icons and text fields. Icons shall designate the sensitive area for touch control and display, which provides a pictorial representation of a switch function.
1. All icon activations shall be annunciated with an audible tone, a color change of the icon, and a change of icon configuration.
 2. Each screen shall annunciate off-screen inputs, such as intercom calls and alarm events. The control terminal operator shall be notified of these events regardless of the screen that is currently displayed on the terminal.

1.09 TOUCHSCREEN SYSTEM – SCREEN CONTROLS/MONITORING FUNCTIONS - SPECIFIC

- A. Specific Icon Control Functions: The drawings include representative control and monitoring screens for several console locations. Following is a description of the control and monitoring functions for the icons presented on those drawings. The following descriptions may not include all control and monitoring functions for all icon types required for this project, but provides a representative sample to indicate the type and level of control and monitoring expected.
- B. Door Control and Monitoring
1. SWING DOOR. Momentarily touching the Unlock icon shall apply power for approximately one second to the lock motor, to begin its unlocking cycle. A GREEN padlock shown locked indicates SECURE condition of the door. A RED padlock shown unlocked indicates UNLOCKED or UNSECURED condition of the door. If door is part of an INTERLOCK GROUP, the icon outline shall become yellow anytime another door in the group is unlocked. An attempt to unlock a door that is part of an interlock group (while another door of the interlock group is insecure) shall cause a dialogue box to be displayed indicating the presence of an interlock. The dialogue box shall include icons for OVERRIDE or CANCEL. Touching the OVERRIDE icon shall defeat the interlock and unlock the selected door. Touching the CANCEL icon shall cancel the dialogue box and return to the floor plan.
 2. MONITORED ONLY DOOR: A GREEN padlock shown locked indicates SECURE condition of the door. A RED padlock shown unlocked indicates UNLOCKED or UNSECURED condition of the door.
 3. FULLY OPERABLE SLIDING DOOR DEVICE: Open/Stop/Close. Momentarily touching the Open icon shall open the door. Momentarily touching the Stop icon shall halt any door movement. Momentarily touching the Close icon shall close the door. The device shall not be allowed to reverse operation without first going through an approximate one second delay of stop time. If the door is part of an interlock group and another door in the group is not secure, the door will not open without overriding the interlock group. A GREEN padlock shown locked indicates SECURE condition of the door. A RED padlock shown unlocked indicates UNLOCKED or UNSECURED condition of the door. If door is part of an INTERLOCK GROUP, the icon outline shall become yellow anytime another door in the group is unlocked. An attempt to unlock a door that is part of an interlock group (while another door of the interlock group is insecure) shall cause a dialogue box to be displayed indicating the presence of an interlock. The dialogue box shall include icons for OVERRIDE or CANCEL. Touching the OVERRIDE icon shall defeat the interlock and unlock the selected door. Touching the CANCEL icon shall cancel the dialogue box and return to the floor plan.
 4. ROLL UP DOOR, SLIDING VEHICLE GATE: See description for fully operable sliding door device.
 5. INTERLOCK OVERRIDE: This function shall be accomplished utilizing an interlock dialogue box. The dialogue box contains two icons, Override and Cancel. When an attempt to unlock or open a door within an Interlocked group of doors where one or more doors are in the insecure position, the Interlock dialogue box shall appear. Selecting the Override icon will allow the opening of the door. Selecting the Cancel icon will return the operator to the previous control screen. When a door is part of an Interlock group and another door within the group is insecure, the outline of the padlock door indication symbol shall illuminate yellow for all doors within the group. Once the door moves to the insecure position, the fill color of the icon shall turn red and depict an unlocked padlock symbol while the outline is simultaneously yellow.
 6. GROUP ASSIGN: There shall be a Group Assign function within the program. Once the Group Assign function has been programmed, touching the Group Release icon will result in the activation of the Group Release function. The Group Release shall have the ability to be programmed with a second confirmation in order to release the group should the owner require.
 7. GROUP RELEASE: Touching the Group Release icon shall display a prompt asking user "Are you sure you want to proceed" and requiring user to click on Yes or No button. If Yes is selected, the ER

- group assigned will release all doors in the group and the door will then return to the group and shall re-lock when closed.
8. EMERGENCY RELEASE:
 - a. Touching the “Emergency Release” icon located in the menu bar of the Touch screen shall switch the view to the primary emergency release screen, which shall contain an Emergency Release icon for each ER group within the facility and an ER Enable icon. Touching the Enable” icon shall arm the system for emergency release and shall display an “Are you Sure?” prompt and “Yes” and “No” icons. Touching the “No” icon shall again display the primary emergency release screen.
 - b. While armed, touching a Emergency Release icon for any ER Group, an emergency Release door switch, or a normally controlled door release switch shall unlock the door or doors associated with that switch and the doors shall remain unlocked until reset. A “ER Reset” icon shall appear on each screen. Touching the “ER reset” icon and then an activated door or Emergency Release icon shall reset the emergency release function for that door or group and the door(s) shall lock.
 - c. The emergency release function shall continue to be armed until the operator returns to the primary emergency release screen and touches the emergency release icon again to disarm.
 9. INTERCOM CONTROL: When an intercom call-in is initiated from a sub-station the following conditions shall apply:
 - a. The intercom station icon shall have a speaker symbol that will flash blue to indicate the call-in along with an audible tone. Touching the intercom station icon will select the audio path to the station and cause the icon speaker symbol to change to steady and blue. Touching the station icon a second time, or selecting another intercom station, will cause the audio path to be closed and the speaker symbol to turn gray in color to indicate the inactive status of the station.
 - b. Once an intercom station is active, the operator shall touch and hold the Push To Talk button on the Intercom Master Console to talk to the associated intercom station, and release the Push To Talk button to listen to the associated intercom station.
 - c. Intercom call-ins shall go into an intercom stack on a first in first out basis. Located in the menu bar shall be two intercom associated icons, “Answer” and “Call End”. Touching the Select icon will select the first Intercom call-in within the stack. Each time the Select icon is touched the current intercom conversation will be terminated and the next call in the stack will be initiated. Touching the “Call End” icon will cancel any current intercom station. Intercom stations are NOT to be displayed in the alarm queue of the Touch Screen control station.
 - d. The Touch Screen shall provide a “FIND” button for the intercom call-in. When multiple call-ins are active, the user can click on the “FIND” button and the system will automatically display the appropriate screen where the first intercom in the que is located.
 - e. Anytime an intercom station is active, the associated camera/cameras are to be displayed on the associated video call up monitor.
 10. PAGING SPEAKER/ZONE: Touching a PAGE icon shall select a paging speaker zone for broadcast. Touching the PAGE icon a second time to reset. The associated Page icon shall have a speaker symbol that will turn blue in color any time the page function is active. The speaker symbol shall be gray in color to indicate the inactive status of the Page The operator shall press and maintain pressure on the Push To Talk switch to talk in order to broadcast out to the affected speakers.
 11. ALARM QUEUE: Located by selecting the “ALARMS” button, the system will automatically display the Active Alarm banner at the top of the Touch Screen. This queue will display a list of alarms in the order at which they were initiated.
 - a. Each alarm shall be depicted in the queue by a text description as well as audibly annunciated. Audible annunciation shall re-sound every 4 seconds until the alarm condition has been acknowledged and reset.
 - b. The alarm condition must be acknowledged by selecting the “ACK” button. The user will subsequently press the “CLEAR” button to reset the alarm that is activated.
 12. ALARM SILENCE: Touching the Alarm Silence icon shall cause the audible alarm to silence. All visible indicators shall remain unaffected.
 13. ALARM RESET: Touching the Alarm Reset icon will return all acknowledged alarm conditions to their normal state, and extinguish any alarm icons only after the alarm signal has been cleared.
 14. CCTV CAMERA CONTROL: CCTV camera icons shall have a camera symbol located within the camera control icon. While a camera is inactive the camera symbol shall be gray. Touching the camera control icon shall display the camera to the appropriate video monitor and cause the camera symbol to

turn orange. If a camera is automatically called-up for an intercom call, the above described icon conditions shall apply for any active cameras.

15. WATCH TOUR (if integrated):
 - a. START: Momentarily depressing the Guard Tour START icon shall activate the Guard Tour System and the icon shall indicate the “active” status of the system. The icon for each remote Guard Tour Station graphically located on the control screens shall illuminate steady when the Guard Tour has been started and each shall extinguish one at a time as each station key-switch has been turned.
 - b. COMPLETE: After the guard has checked into all remote watch tour stations the tour is considered complete.
 - c. RESET: Touching the RESET switch can end the active tour.
 - d. If the Guard Tour Stations are not activated in the specified allotted time, then all illuminated station icons will flash with an audible tone sounding at the control station.
 - e. The following events shall be recorded in the SMS database:
 - 1) Start Guard Tour: “Guard Tour started at current time”
 - 2) Allotted time expired: “Guard Tour ended before completing – current time”
 - 3) Individual station when activated : “Guard Tour individual station activated – current time”
 - 4) Completed: “Guard Tour completed – current time”
16. UTILITY POWER CONTROL: Touching any of the Utility icons shall either turn on or turn off the associated utility. The associated indication icon shall be illuminated when the utility is on and shall extinguish when off.
 - a. The utilities are defined as:
 - 1) PHONE: Inmate telephones located in the housing dayrooms. (off = telephones not operable)
 - 2) TV: Television power outlet located adjacent to the TV. (off = power is not present at TV)
 - 3) WATER: Water valves controlling water to inmate cells. (off = running water is not available)
 - 4) DAY: Light fixtures in Housing dayrooms are controlled on/off.
 - 5) NIGHT: Night light fixtures in the cells are controlled on/off.
 - 6) CELLS: Main cell light fixture is controlled on/off.
17. PANEL DISABLE: Pressing the panel disable icon will disable the control station and initiate an alarm at the Central Control touch screen. The station can be enabled only from the touch screen control station or master graphic control panel having control of the area. While disabled, the screen shall be blank and display “Panel Disabled”.
18. PANEL CONTROL: There shall be a screen that is called from the Touch Screen utility screen that shall have an icon for each Control Station/Graphic Panel in the system. The icon shall indicate the Enabled/Disable condition of each control location. This function is only available to the Master Control station located in Central Control. Each control station may be enabled/disabled from these control icons.
19. CONTROL TRANSFER/LOG-OFF: Touching the “LOG OFF” icon will switch control of the intercom call in function to the designated transfer control station and cause the “LOG-IN” screen to be displayed. Control can be returned to the panel by entering a valid log-in code; no action is required by the station to which the panel was transferred.
20. MAIN SCREEN: Touching this icon will switch the display to an overall map of the facility. This control screen shall contain icons that will direct the operator to control screens for the various areas of the facility.
21. AREA ICONS: All icons related to the specific touch screen control area are visible for the user when logged in.

1.10 TOUCHSCREEN SYSTEM ALARM REPORTING FUNCTIONS

- A. The following alarms shall be reported on the Central Control touch screen terminals and logged on the SMS computer:
 1. Unauthorized exit (opening) of any door monitored/controlled by the operator terminal or any station transferred to operator position.
 2. “Panel Disable” alarms from any control station.
 3. Duress Alarms

4. UPS Alarms
5. Interlock Overrides
6. Emergency Release

1.11 SECURITY MANAGEMENT SYSTEM DESCRIPTION

A Security Management System (SMS) shall be furnished and installed utilizing a dedicated local area network (LAN)

- A. The system shall:
 1. Provide a means of archiving alarm and other activity data in a SQL Server compatible data base.
 2. Provide packaged data reporting programs to generate activity reports based on user selectable search criteria. All reports shall be displayed in chronological order.
- B. As the touch screen terminal or PLC receives or generates data, the data shall be copied to the Security Management System.
- C. Logging: System shall log all control and alarm events in the facility, including door control, and operator log-on and log-off activities.
- D. The administrative Terminal located on the network shall be configured to access the database and activity reports.

PART 2 - PRODUCTS

2.01 Acceptable Integrators

- A. Except as otherwise specified, herein, or in the General Conditions, the equipment and materials of this Section shall be products of the following manufacturers, subject to compliance with specification requirements and provided each manufacturer meets all requirements of the Quality Assurance Section of this Specification. Proprietary and custom systems are not acceptable.
 1. Icotech, Montgomery, AL
 2. Sustainable Security Solutions, San Antonio, TX

2.02 TOUCH SCREEN SYSTEM

- A. Graphical User Interface Software: The touch screen software shall have the following characteristics:
 1. Non-proprietary, standard, off-the-shelf product of a company other than the Division 28 Contractor.
 2. Nationally distributed.
 3. National software technical support.
 4. Based upon a Microsoft Windows (latest version) operating system.
 5. Provided with documentation to allow User Programming.
 6. Software shall be Wonderware Intouch, Aveva Edge, Econ Control Systems, or pre-approved equal.
- B. LCD Monitor and Transducer: The touch screen monitor shall have the following characteristics:
 1. Useful screen area: 27.48" Horizontal, 15.51" Vertical.
 2. Display size: 32" diagonal.
 3. Optimal resolution: 1920 x 1080.
 4. Colors: 16.7 million (8 bit).
 5. LCD Panel brightness: 400 nits.
 6. Response time: 8 msec (typical).
 7. Viewing angle: Horizontal 178° total, Vertical 178° total.
 8. Contrast Ratio: 3500:1 (typical).
 9. Input Audio: Computer audio on 3.5mm stereo mini.
 10. Input Data: Serial or USB 1.1.
 11. Power Dissipation: 69 W (typical).
 12. Temperature: Operating 0oC to 40oC, Storage -20oC to 60oC.
 13. Speakers: Two built-in, 7W speakers in display head.
 14. Mounting Options: 400 mm x 200 mm Vesa mount, desk top mount.
 15. Monitor shall be Elo Touch Systems 3220L or pre-approved equal.
- C. Touch Screen Computer
 1. Intel® Core i7-7700 Processor (Quad Core, 3.6GHz, 8MB Cache).
 2. Windows® 11 Professional 64 Bit.

3. 16GB, DDR4 Memory, 2400MHz.
 4. 1GB video graphics card.
 5. 500 GB SSD.
 6. 16XDVD+/-RW drive.
 7. 10/100/1000 Gigabit PCI Ethernet adapter.
 8. USB keyboard.
 9. Optical USB mouse.
 10. Digital PCI sound card.
 11. Shall be powered by UPS.
 12. The operation of the touch screen shall not depend on a keyboard. The keyboard shall be stowed and shall not be normally accessible from the console surface except as required for installation and maintenance purposes.
 13. Acceptable PC manufacturers
 - a. Lenovo
 - b. Dell
 - c. Hewlett Packard
- D. Network Switches
1. Ethernet switch shall be IEEE 802.3 compliant and based on a modular design consisting of a main chassis and plug on modules. The switch will have the ability to utilize a variety of media modules such as 1000Base, single mode 1000Base and 100BaseFL and multimode 10BaseFL and 100BaseFL. The Ethernet switch shall be an intelligent device capable of automatically re-routing communications in the event of a downstream failure or cable malfunction.
 2. The unit shall be capable of full and half duplex communication and housing multiple Ethernet modules supporting any standard Ethernet media at 1000megabits per second Ethernet speed. Ethernet modules will be available for direct connection to an Ethernet network using 10BaseT, or 1000Base TX (RJ-45), and fiber optic 1000Base or 10GigBase. All modules will be supplied with integral LED indicators for monitoring communication link status. All fiber optic modules will be IEEE 802.3 FIO compliant.
 3. Ethernet Switch will be rack mountable.
 4. The Ethernet Switch shall support SNMP management.
 5. Switch(s) shall be Ubiquiti series switches, Cisco series switches or approved equal.

2.03 SYSTEM PERFORMANCE

- A. The systems shall be configured to meet the following performance requirements:
1. Outputs to field devices such as door locks shall activate within 300 msec of the touch screen icon activation. Activation of any touch screen icon or control switch shall provide a short audible tone.
 2. Video screen displays shall be refreshed within 300 msec. Screen graphics shall be stored in RAM to effect fast refresh with no moving parts. Storage on disk drive shall be for back-up purposes only.
 3. The system shall annunciate alarms including touch screen display, video graphic alarm display, and audible tone in 500 msec or less from the time the field device is activated. Alarm audibles shall be distinctly discernible from intercom call-in tones and touch screen audible feedback tones.
 4. Touch screen terminals shall not be interdependent. The failure of one touch screen terminal shall not affect the operation of other touch screen terminals. The use of server based applications is strictly prohibited. Each Touch screen stations shall contain a licensed copy of the VGUI software.
 5. System faults or crashes shall not be capable of activating field outputs such as door locks during system failure or reboot.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data; including product technical bulletins, product catalog, installation instructions, submittal sketches or drawings, and product carton instructions for installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify that related conditions, including equipment that has been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
 - B. All devices connected to equipment specified in this section shall bear the UL, cUL, or CSA label and comply with all applicable National Electrical Code (NEC) standards.
- 3.03 PREPARATION
 - A. Division 28 Subcontractor shall develop custom software as required to effect the functions of the system as dictated by the drawings and Specifications.
 - B. Division 28 Subcontractor shall provide equipment cabinets for installation of the control equipment and cable terminations to the equipment.
 - C. All equipment related to the system shall be factory tested before shipment.
- 3.04 INSTALLATION
 - A. Contractor shall furnish all equipment, labor, system setup, and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein.
 - B. Install in accordance with manufacturer's handling and installation instructions.
 - C. Install in accordance with all local and pertaining codes and regulations.
 - D. All equipment and systems shall be installed by the ESC. Subcontracting of equipment installation shall not be permitted.
 - E. Equipment shall be ready to use condition at end of installation.
 - F. Energize equipment in accordance with manufacturer's instructions.
- 3.05 PROTECTION AND CLEANING
 - A. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
 - B. Touch up, repair, or replace damaged components before Substantial Completion.
 - C. Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of equipment. Remove construction debris from equipment area and dispose of debris.
 - D. Clean integral air filters, heatsinks, grills, and fans before Substantial Completion and Commissioning Services.
- 3.06 WARRANTY
 - A. The ESC shall provide a single source warranty for all supplied equipment specified in this section to be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.

END OF SECTION 280120

SECTION 280140 - PROGRAMMABLE LOGIC CONTROLLER

PART 1 - GENERAL

1.01 SUMMARY.

- A. Provide Programmable Logic Controllers as specified herein and as shown on the schedules and drawings. Contractor shall receive, place, connect, and mount all equipment specified in this Section per the manufacturer's instructions. Contractor shall furnish all hardware, wire, connectors, and other necessary items as required for a complete and functional control system.
- B. Related Sections:
 - 1. Section 11190 Detention Equipment
 - 2. Section 08710 Door Hardware
 - 3. Section 260000 Electrical
 - 4. Section 280000 Security Electronics, General
 - 5. Section 280120 Touch Screen System
 - 6. Section 280150 Electronic Relay System
 - 7. Section 280200 Intercommunications System
 - 8. Section 280300 Closed Circuit Television System

1.02 REFERENCES.

- A. The General Conditions, Supplementary Conditions, and Division 1 Specifications shall apply to all work of this section.
- B. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- C. Underwriter's Laboratories (UL)
 - 1. UL 508 Industrial Control Equipment
 - 2. NEC National Electrical Code (latest edition)

1.03 WORK INCLUDED

- A. Provide materials, equipment, programming and services as required to install programmable logic controllers as shown on the drawings or as specified herein.
- B. Major Sub-systems include:
 - 1. Programmable Logic Controllers (PLC's).
 - 2. Electronic relay system.

1.04 COORDINATION WITH OTHER TRADES

- A. Coordinate the work of this Section with that of other sections as required ensuring that the entire work of this Project will be carried out in an orderly, complete and coordinated fashion.

1.05 APPROVALS

- A. General
 - 1. Submittals shall be made in accordance with the General Provisions (Section 280000) of these specifications.
- B. Specific Requirements:
 - 1. Submit catalog cuts for all equipment and devices being furnished under this Section.

1.06 DESCRIPTION

- A. Programmable Logic Controllers (PLC) shall provide control and monitoring functions for systems as described on the drawings and in these specifications.

- B. The controllers shall provide all necessary logic functions, timing functions, memory, software, input/output points and communication capabilities for the operating features required to meet all of the requirements for the specifications.
- C. Logic functions shall include but limited to AND, OR and INVERT functions with sufficient levels to provide operating features required to perform all of the functions required by the specifications.
- D. The controller shall be standard off the shelf, commercially available equipment. Proprietary or custom cage mounted discrete logic cards or PLC units and associated software are not acceptable.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. The PLC shall be the product of a manufacturer engaged in the production of controllers for industrial application for a minimum of ten years. Only manufactures with national distribution and local parts outlets will be considered.
- B. The program shall be developed for each controller on an individual basis and shall be stored in a non-volatile memory.
- C. The programming format shall be traditional relay ladder logic utilizing basic and advanced instruction sets for function generation. Controllers that utilize spreadsheets and other means of programming shall not be acceptable.
- D. The I/O modules shall be standard backplane type mounting and shall contain status LED's for I/O point on the module. Input/Output modules shall be 32, 64 or 96 point modules and available in both sinking and sourcing inputs.
- E. I/O modules shall be installed in any available slot in the CPU or expansion baseplates, and shall require no tools for insertion and extraction.
- F. The system design shall accommodate the replacement of assemblies without having to disconnect field wiring. Wherever possible, removable connectors shall be used to connect field wiring to the individual circuit board assemblies
- G. The controller shall operate on 105 to 130 VAC, 60 Hz and contain an Integral circuit breaker for overload protection. The controller shall Operate in temperatures of 0 to 60C and up to 95 percent humidity(non-condensing). The controller shall conform to electrical noise standards of IEEE-472.
- H. PLC CPU and all associated power supplies (logic and CPU) shall be powered by a UPS.
- I. The PLC shall be Modicon Quantum Series, Allen-Bradley Control Logix Series, Omron CJ2 Series, ECON Systems or pre-approved equal

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data; including product technical bulletins, product catalog, installation instructions, submittal sketches or drawings, and product carton instructions for installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify that related conditions, including equipment that has been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
- B. All devices connected to equipment specified in this section shall bear the UL, cUL, or CSA label and comply with all applicable National Electrical Code (NEC) standards.

3.03 PREPARATION

- A. All equipment related to the system shall be factory tested before shipment.

3.04 INSTALLATION

- A. Contractor shall furnish all equipment, labor, system setup, and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein.
- B. Install in accordance with manufacturer's handling and installation instructions.
- C. Install in accordance with all local and pertaining codes and regulations.
- D. All equipment and systems shall be installed by the ESC. Subcontracting of equipment installation shall not be permitted.
- E. Equipment shall be ready to use condition at end of installation.

- F. Energize equipment in accordance with manufacturer's instructions.
- 3.05 PROTECTION AND CLEANING
 - A. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
 - B. Touch up, repair, or replace damaged components before Substantial Completion.
 - C. Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of equipment. Remove construction debris from equipment area and dispose of debris.
 - D. Clean integral air filters, heatsinks, grills, and fans before Substantial Completion and Commissioning Services.
- 3.06 WARRANTY
 - A. The ESC shall provide a single source warranty for all supplied equipment specified in this section to be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.

END OF SECTION 280140

SECTION 280150 - ELECTRONIC RELAY SYSTEM

PART 1 - GENERAL

1.01 SUMMARY.

- A. Provide Electronic Relay System as specified herein. Installing contractor shall receive, place, connect, and mount all equipment specified in this Section per the manufacturer's instructions. Installing contractor shall furnish all hardware, wire, connectors, and other necessary items as required for a complete and functional control system.
- B. Related Sections:
 - 1. Section Detention Equipment
 - 2. Section 08710 Door Hardware
 - 3. Section 260000 Electrical
 - 4. Section 280000 Security Electronics, General
 - 5. Section 280120 Touch Screen System
 - 6. Section 280140 Programmable Logic Controller
 - 7. Section 280200 Intercommunications System
 - 8. Section 280300 Closed Circuit Television System

1.02 REFERENCES.

- A. The General Conditions, Supplementary Conditions, and Division 1 Specifications shall apply to all work of this section.
- B. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- C. Underwriter's Laboratories (UL)
 - 1. UL 508 Industrial Control Equipment
 - 2. NEC National Electrical Code (latest edition)

1.03 WORK INCLUDED

- A. Provide relays, terminals, power supplies, cabinetry and other equipment as required to install an Electronic Relay System to facilitate a completely function system as shown on the drawings or as specified herein.
- B. Major Sub-systems include:
 - 1. Programmable Logic Controllers (PLC's).
 - 2. Electronic relay system.

1.04 COORDINATION WITH OTHER TRADES

- A. Coordinate the work of this Section with that of other sections as required to ensure that the entire work of this Project will be carried out in an orderly, complete and coordinated fashion.

1.05 APPROVALS

- A. General
 - 1. Submittals shall be made in accordance with the General Provisions (Section 280000) of these specifications.
- B. Specific Requirements:
 - 1. Submit catalog cuts for all equipment and devices being furnished under this Section.

1.06 DESCRIPTION

- A. The relays shall provide the actual switching of power to all electric locking hardware, lights etc.
- B. All relays shall be mounted in NEMA-1 type cabinets with removable steel mounting plate or in a security grade enclosed equipment rack. The cabinet shall be sized according to the number of relays required by the job and constructed of code grade steel. The cabinets shall be mounted where shown on the drawings.
- C. All relays shall be of the electro-mechanical type. The use of solid state type relays is strictly prohibited.
- D. All relays, terminals and other equipment shall be standard off the shelf, commercially available components.

- E. Relays and terminals for each device, i.e. doors, shall be grouped together and each terminal labeled with the device designation, wire color, power supply nomenclature and PLC I/O.
- F. Each door shall have a device for overcurrent protection. Overcurrent protection devices shall be fused. The overcurrent device shall provide protection for both constant lock power (if applicable) and unlock/lock signal voltage.
- G. All control wiring in the relay cabinet shall be grouped and laced with nylon tie straps with a maximum spacing of one inch. Straps will be placed within 1/2" on each side of all bundle breakouts. Wiring will be supported at intervals not exceeding four inches and labeled at both ends.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Relays
 - 1. Nominal input voltage 24 VDC.
 - 2. Nominal input current 9 mA.
 - 3. Typical response time 5 ms.
 - 4. Typical release time 8 ms.
 - 5. Continuous current rating 10 A.
 - 6. Relays shall be Din rail mounted with a base structure and field replaceable relay module.
 - 7. Shall have LED indication for relay status.
 - 8. Acceptable Manufacturers
 - a. Phoenix
 - b. Omron
 - c. Idec
- B. Power Supplies
 - 1. Nominal input voltage 115 VAC.
 - 2. Nominal output voltage 24 VDC.
 - 3. Output current 10 A.
 - 4. MTBF > 500,000 hrs
 - 5. Ambient temperature operating range -25 C to 70 C.
 - 6. Din rail mounted
 - 7. Acceptable Manufacturers
 - a. Phoenix
 - b. Power One
- C. Circuit Breakers - We changed this to fused from above
 - 1. Shall be thermal miniature circuit breaker, pluggable in a screw type terminal block.
 - 2. Sized for the device being protected.
 - 3. Rated surge 3 kV.
 - 4. Nominal voltage 65 VDC, 250 VAC.
 - 5. Ambient operating temperature -20 C to 60 C.
 - 6. Acceptable Manufacturers – Eaton

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data; including product technical bulletins, product catalog, installation instructions, submittal sketches or drawings, and product carton instructions for installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify that related conditions, including equipment that has been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
- B. All devices connected to equipment specified in this section shall bear the UL, cUL, or CSA label and comply with all applicable National Electrical Code (NEC) standards.

3.03 PREPARATION

- A. All equipment related to the system shall be factory tested before shipment.

3.04 INSTALLATION

- A. Contractor shall furnish all equipment, labor, system setup, and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein.
- B. All control wiring systems shall use solid or stranded copper conductors.
- C. All wiring systems shall be labeled and color coded with labeling and coding shown on shop drawings. White conductors shall be used only for neutral conductors and green only for grounding conductors. All conductors within junction boxes, pull boxes and equipment enclosures shall be grouped and laced with nylon tie straps with identification tabs (equivalent to Ideal Industries #41-693 write-on I.D. marker plates) in individual sets, serving individual locks or groups. Conductor group shall be identified on the tab with respect to room or area served. Control system conductors shall not be spliced; control conductors shall be continuous between the control panel and the relay cabinet.
- D. Install in accordance with all local and pertaining codes and regulations.
- E. All equipment and systems shall be installed by the ESC. Subcontracting of equipment installation shall not be permitted.
- F. Equipment shall be ready to use condition at end of installation.
- G. Energize equipment in accordance with manufacturer's instructions.
- H. All panels must be certified and listed by UL and must be labeled accordingly.

3.05 PROTECTION AND CLEANING

- A. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
- B. Touch up, repair, or replace damaged components before Substantial Completion.
- C. Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of equipment. Remove construction debris from equipment area and dispose of debris.
- D. Clean integral air filters, heatsinks, grills, and fans before Substantial Completion and Commissioning Services.

3.06 WARRANTY

- A. The ESC shall provide a single source warranty for all supplied equipment specified in this section to be free of defects in material and workmanship for a period of two (2) year from the date of substantial completion.

END OF SECTION 280150

SECTION 280200 - INTERCOMMUNICATIONS SYSTEM

PART 1 - GENERAL

1.01 SUMMARY.

- A. Provide Intercommunications equipment as specified herein and as shown on the schedules and drawings. The Contractor shall receive, place, connect, and mount all equipment specified in this Section per the manufacturer's instructions. The Contractor shall furnish all hardware, wire, connectors, and other necessary items as required for a complete and functional Intercommunications system.
- B. Related Sections:
 - 1. Section 11190 Detention Equipment
 - 2. Section 260000 Electrical
 - 3. Section 280000 Security Electronics, General
 - 4. Section 280120 Touch Screen System
 - 5. Section 280140 Programmable Logic Controller
 - 6. Section 280300 Closed Circuit Television System

1.02 REFERENCES.

- A. The General Conditions, Supplementary Conditions, and Division 1 Specifications shall apply to all work of this section.
- B. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- C. Underwriter's Laboratories (UL)
 - 1. UL 508 Industrial Control Equipment
 - 2. NEC National Electrical Code (latest edition)

1.03 WORK INCLUDED

- A. Provide relays, terminals, power supplies, intercom amplifiers, paging amplifiers, cabinetry and other equipment as required to install an Intercom System to facilitate a completely function system as shown on the drawings or as specified herein.
- B. Major Sub-systems include:
 - 1. Programmable Logic Controllers (PLC's).
 - 2. Touch Screen Control Stations.

1.04 APPROVALS

- A. General
 - 1. Submittals shall be made in accordance with the General Provisions (Section 280000) of these specifications.
- B. Specific Requirements:
 - 1. Submit catalog cuts for all equipment and devices being furnished under this Section.
 - 2. Submit a complete Intercom System riser diagram. Diagram shall include labeling of each station and the corresponding relay card point for termination, interconnecting wiring of all components including but not limited to relay cards, intercom amplifiers, paging amplifiers, intercom stations, paging speakers and master intercom stations.

1.05 DESCRIPTION

- A. The relays shall provide the actual switching of audio paths to all intercom stations and paging zones.
- B. All relays shall be mounted in NEMA-1 type cabinets with removable steel mounting plate or security grade enclosed equipment racks. The cabinet shall be sized according to the number of relays required by the job and constructed of code grade steel. The cabinets shall be mounted where shown on the drawings.
- C. All relays shall be of the electro-mechanical type. The use of solid state type relays is strictly prohibited.
- D. All relays, terminals and other equipment shall be standard off the shelf, commercially available components.

- E. All intercom station and paging zone termination points shall be permanently labeled in the cabinet.
- F. The PLC shall be the basis of control for the integrated intercom system and shall provide switching and control through a series of input and output points from the PLC.
- G. All intercom controls shall be via the Touch screen control stations and/or Graphic Control Panels.
- H. Each remote station shall be a security grade station with a speaker, microphone, and a call push-button.
- I. Paging speakers located within inmate accessible areas shall have a vandal proof baffle installed.
- J. Each operator position shall have the option of communicating via desk-mounted intercom station employing a microphone and a speaker, or a headset. The desk mounted intercom station shall be equipped with a push-to-talk switch.
- K. The Programmable Logic Controllers shall allow call up cameras associated with each intercom station on the control panel's monitor while an intercom link is connected. Camera call-ups for each station are to be determined and at the discretion of the Architect/Engineer.
- L. When a single camera is associated with the intercom selection, CCTV video shall be displayed on a second monitor.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Except as otherwise specified, herein, or in the General Conditions, the equipment and materials of this Section shall be products of the following listed manufacturers, subject to compliance with the specification requirements and provided each manufacturer meets all requirements of the Quality Assurance Section of this specification. Proprietary or custom units and associated software are not acceptable.
- B. Audio control boards as required to interface to remote intercom stations and paging zones.
- C. Power Supplies. Redundant power supplies shall be provided with alarm reporting of any failed power supply.
- D. Discrete input/output boards.
- E. Intercom master stations.
- F. Interface boards to the PABX for paging access (where required).
- G. All software and programming to perform the functions described herein.
- H. Custom interface to the Touch screen control stations and/or Graphic Control panels.
- I. All consoles shall have a gooseneck type or hidden, surface mounted microphone permanently mounted to the top of the console panel.
- J. System shall be the Tech-Works, Phoenix Intercom Systems, ECON Systems or approved equal.
- K. Intercom Amplifiers
 - 1. Rated Power – 20 Watts @ 25 VRMS (balanced).
 - 2. Microphone Input – 1000 ohms balanced, –80dBm, with phantom power.
 - 3. Line level recording output.
 - 4. Operator Speaker Output: 3 Watts into 25 Volt speaker.
 - 5. Frequency Response 250 Hz to 10KHz.
 - 6. Distortion at Full Rated Output < 1% T.H.D.
 - 7. Page line level output.
 - 8. Power: 24VDC, 2A Power Supply.
 - 9. Unit shall be Tech Works ICA-202D or approved equal.
- L. Paging Amplifiers
 - 1. 60 Watt Amplifiers
 - a. Rated Output – 60 Watts RMS.
 - b. Frequency Response – 40 Hz to 15 KHz ± 1.5 dB at -3 dB below RPO.
 - c. Distortion – Less than 3%, 60 Hz to 15 KHz. Less than 2% 70 Hz to 10 KHz.
 - d. Noise Level – 84 dB below RPO (input control full on). 90 dB below RPO (input control full off).
 - e. Input Sensativity – 0.3 volts for RPO.
 - f. Input Impedance – 13,000 ohms unbalanced.
 - g. Output Impedance – 10.4 ohms, 25 V line.

- h. Center Tap Balance - $\pm 2\%$.
 - i. Output Regulation – Less than 2dB, full load to no load.
 - j. Auxiliary Power Available – 1.2 amp @ 28 VDC fully isolated.
 - k. Unit shall be Rauland-Borg model DAX 60 or approved equal.
- 2. 120 Watt Amplifiers
 - a. Rated Output – 120 Watts RMS.
 - b. Frequency Response – 40 Hz to 15 KHz ± 1.5 dB at -3 dB below RPO.
 - c. Distortion – Less than 3%, 60 Hz to 15 KHz. Less than 2% 70 Hz to 10 KHz.
 - d. Noise Level – 84 dB below RPO (input control full on). 90 dB below RPO (input control full off).
 - e. Input Sensitivity – 0.3 volts for RPO.
 - f. Input Impedance – 13,000 ohms unbalanced.
 - g. Output Impedance – 5.2 ohms, 25 V line.
 - h. Center Tap Balance - $\pm 2\%$.
 - i. Output Regulation – Less than 2dB, full load to no load.
 - j. Auxiliary Power Available – 1.2 amp @ 28 VDC fully isolated.
 - k. Unit shall be Rauland-Borg model DAX 120, Lowell or approved equal.
- M. Intercom Station Card
 - 1. Shall contain 25 DPDT relays.
 - 2. Relays – 24 VDC at 25 mA; DPST precious metal contacts.
 - 3. Each relay shall be hermetically sealed to prevent contact contamination, and have a life expectancy of more than 1,000,000 operations.
 - 4. Unit shall be Phoenix Contact 2907028, ECON Systems or approved equal.
- N. Power Supplies
 - 1. Output Voltage – 24 VDC.
 - 2. Output Current – 10 amps DC.
 - 3. Efficiency > 92.5 %
 - 4. Residual ripple < 50 mVPP (with nominal values)
 - 5. Status display "DC OK" LED green / UOUT < 0.9 x UN: LED flashing
 - 6. Ambient temperature (operation) -25 °C ... 70 °C (> 60°C derating)
 - 7. Max. permissible relative humidity (operation) 95 % (at 25°C, no condensation)
 - 8. Unit shall be Phoenix Contact QUINT-PS/1AC/24DC/10.
- O. Intercom Stations
 - 1. Intercom slave station shall be a flush-mounted security type with a 3" acrylic impregnated cotton cloth cone speaker. The unit shall have a momentary call-in switch, stainless steel tamperproof hardware, and a backbox. Unit shall have security steel offset grill and a 11- gauge stainless steel plate. Unit shall mount on a standard three gang 3 1/2" deep masonry box. Gangable type boxes shall not be acceptable. Mount unit 48" AFF to top. All units mounted in exterior spaces shall be of the weatherproof configuration.
 - 2. Intercom stations shall be Quam CIS4/25 or approved equal.
- P. Paging Speakers
 - 1. 8" dual cone.
 - 2. Power Handling – 25 Watts peak, 15 Watts RMS.
 - 3. Sensitivity – 97 dB peak, 94 dB average.
 - 4. Frequency Response – 45 Hz to 19 KHz nominal.
 - 5. Dispersion - 105° (2 KHz octave band, -6 dB points).
 - 6. Magnet Weight – Nominal, 10 oz.
 - 7. Shall have a built in matching transformer for both 25V & 70V audio lines.
 - 8. Shall be Quam 8C10PAOT or approved equal.
- Q. Exterior Paging Horn
 - 1. Power rating – 15 Watts continuous.

2. Frequency Response – 40 to 14,000 Hz nominal.
 3. Sensitivity – 120 dB at 15 Watts (peak).
 4. Dispersion Angle - 70° (-6 dB, 2000 Hz octave band).
 5. Shall be Quam QH16T or approved equal.
- R. Vandal Proof Speaker Baffle
1. Shall be cast from aluminum alloy with a tensile strength of 44,000 PSI and reinforced with a perforated 22-gauge CRS stud-mounting loudspeaker plate.
 2. Shall be matched with the appropriate surface or recessed speaker enclosure.
 3. Shall be Quam BS8VP or approved equal.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data; including product technical bulletins, product catalog, installation instructions, submittal sketches or drawings, and product carton instructions for installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify that related conditions, including equipment that has been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
- B. All devices connected to equipment specified in this section shall bear the UL, cUL, or CSA label and comply with all applicable National Electrical Code (NEC) standards.

3.03 PREPARATION

- A. Division 28 Subcontractor shall develop custom software as required to effect the functions of the system as dictated by the drawings and Specifications.
- B. Division 28 Subcontractor shall provide equipment cabinets for installation of the control equipment and cable terminations to the equipment.
- C. All equipment related to the system shall be factory tested before shipment.

3.04 INSTALLATION

- A. Contractor shall furnish all equipment, labor, system setup, and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein.
- B. Install in accordance with manufacturer's handling and installation instructions.
- C. Install in accordance with all local and pertaining codes and regulations.
- D. All equipment and systems shall be installed by the ESC. Subcontracting of equipment installation shall not be permitted.
- E. Equipment shall be ready to use condition at end of installation.
- F. Energize equipment in accordance with manufacturer's instructions.

3.05 PROTECTION AND CLEANING

- A. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
- B. Touch up, repair, or replace damaged components before Substantial Completion.
- C. Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of equipment. Remove construction debris from equipment area and dispose of debris.
- D. Clean integral air filters, heatsinks, grills, and fans before Substantial Completion and Commissioning Services.

3.06 WARRANTY

- A. The ESC shall provide a single source warranty for all supplied equipment specified in this section to be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.

END OF SECTION 280200

SECTION 280300 - IP VIDEO SURVEILLANCE SYSTEM

PART 1 - GENERAL**1.01 SUMMARY.**

- A. Provide IP Video Equipment as specified herein and as shown on the schedules and drawings. Installing contractor shall receive, place, connect, and mount all equipment specified in this Section per the manufacturer's instructions. Installing contractor shall furnish all hardware, wire, connectors, and other necessary items as required for a complete and functional IP Video System.
- B. Related Sections:
 - 1. Section 11190 Detention Equipment
 - 2. Section 260000 Electrical
 - 3. Section 280000 Security Electronics, General
 - 4. Section 280110 Graphic Control Panels
 - 5. Section 280120 Touch Screen System
 - 6. Section 280140 Programmable Logic Controller
 - 7. Section 280200 Intercommunications System

1.02 REFERENCES.

- A. The General Conditions, Supplementary Conditions, and Division 1 Specifications shall apply to all work of this section.
- B. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- C. Underwriter's Laboratories (UL)
 - 1. UL 508 Industrial Control Equipment
 - 2. NEC National Electrical Code (latest edition)
- D. Network – IEEE
 - 1. 802.3 Ethernet Standards
 - 2. 802.1x Port-based Network Access Control
- E. Video
 - 1. ISO / IEC 14496–10, MPEG-4 Part 10 (ITU H.264)
 - 2. ISO / IEC 10918 – JPEG
 - 3. ONVIF – Profiles S G and T
- F. Federal Communications Commission (FCC):
 - 1. FCC Rules and Regulation of Title 47 of CFR Part 15 Subpart B Class A.

1.03 WORK INCLUDED

- A. Included under this Section of the work shall be the furnishing, installation, connection, aiming and testing of the complete IP Video System including, but not limited to, cameras, microphones, housings, mounts, cables, monitors, network switches, network video recorders and storage equipment, and fiber optic systems.
- B. Major Sub-systems include:
 - 1. Programmable Logic Controllers (PLC's).
 - 2. Touch Screen Control Stations.
- C. The lenses provided for cameras shall be changed as required, at no cost, to provide the Owner with an acceptable field of view.

1.04 APPROVALS

- A. General
 - 1. Submittals shall be made in accordance with the General Provisions (Section 280000) of these specifications.
- B. Specific Requirements:

1. Submit catalog cuts for all equipment and devices being furnished under this Section.
2. Submit a complete IP Video System riser diagram. Diagram shall include labeling of each camera and its corresponding head end equipment input, interconnecting wiring of all components including but not limited to digital controllers, digital video recorders, camera power supplies, monitors, control keyboards, and PLC interface connections.
3. Submit plan drawings showing location, mounting and viewing angle of each camera.

1.05 DESCRIPTION

- A. The IP Video System shall monitor spaces as shown on the drawings and function as shown on the IP Video System functional schematic.
- B. All cameras shall be recorded, and video storage shall be sized to retain recordings for all video for a duration of 30 days. All cameras shall be recorded at their native resolution at a rate of 12 images per second for motion recordings and 3 images per second for continuous recording. Recording shall be calculated for a minimum of 70% motion.
- C. A VMS integration method shall be furnished and installed to provide auto select and manual selection of video cameras. Auto-select shall be initiated by acknowledging intercom call-in requests or by inputs from the Touch Screen or desk mounted video control panels. A manual video selector shall be incorporated into the Touch Screen System to provide for selection of a specific camera to be monitored by an operator. Switching logic for auto selection of video may be a single logic control unit or may represent logic control signals generated from other systems such as the intercom system or door locking control system.
- D. The HMI software shall allow for a single camera call up when an intercom is pressed and a camera is associated with that intercom station. The camera call up must be able to be displayed wither on the touchscreen or a secondary monitor.
- E. The HMI software shall be the basis of control for the integrated IP Video System Camera call-up. A communications interface shall be provided between the PLC and the IP Video System.
- F. Software Licensing and Warranty:
 1. Software licensing should be on a per device basis (e.g. 1 x license for 1 IP Camera or I/O device) with no base license for additional features or capabilities.
 2. The VMS Software should be completely free for live streaming or playback of offline media files (images, videos).
 3. Desktop Client Software shall be available for download at no additional charge to the owner. There shall be no license fee associated with Desktop Client Software.
 4. Lifetime software upgrades shall be provided by the Manufacturer without cost and without the need for an annual maintenance agreement.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Except as otherwise specified, herein, or in the General Conditions, the equipment and materials of this Section shall be products of the following listed manufacturers, subject to compliance with the specification requirements and provided each manufacturer meets all requirements of the Quality Assurance Section of this specification.
- B. Acceptable Manufacturers:
 1. Hanwha-Techwin, Teaneck, NJ
 2. Motorola Avigilon
 3. I-Pro
 4. Bosch, Lancaster, PA
- C. Hanwha-Techwin is used as the basis of design. Comparable equipment from other listed manufacturers may be used if all specified requirements are incorporated.
- D. Cameras:
 1. IP Cameras shall be the standard product of one manufacturer complying with not less than the specifications contained herein. Installation of each camera shall include mounting brackets and/or camera housings fully compatible with the camera provided. All interior and exterior cameras shall be equal to the models specified following.
 2. Type 1-Indoor Mini Dome, Surface Mounted 2 MP:

- a. Camera shall incorporate a modular design having the mounting plate, camera case, camera module and dome cover being separate components. The camera module shall magnetically attach to the camera case and be interchangeable between camera models.
 - b. Rugged, High-Impact and Vandal Resistant, Puncture Proof Domes
 - c. Tamper-Resistant Hardware
 - d. Minimum Illumination: Color: 0.015Lux (F1.4, 1/30sec), BW: 0.0015Lux (F1.4, 1/30sec)
 - e. Motorized Varifocal Lens of 2.8 mm to 12.0 mm with Auto Iris
 - f. Angular Field of View
 - 1) H: 119.5°(Wide)~27.9°(Tele)
 - 2) V: 62.8°(Wide)~15.7°(Tele)
 - 3) D: 142.1°(Wide)~32.0°(Tele)
 - g. Manual Pan / Tilt / Rotate Range: 0°~360° / -45°~85° / 0°~355°
 - h. Resolution: 2.0 Megapixel (1945 X 1097)
 - i. Digital Image Stabilization – built-in gyro sensor
 - j. Shall be a true Day/Night camera with Wide Dynamic Range (WDR)
 - 1) Day & Night: Auto (ICR)
 - 2) Wide Dynamic Range: 150dB
 - k. Privacy Masking: 32ea, polygonal zones
 - l. Analytics: Defocus detection, Fog detection, Face detection, Motion detection, Digital auto tracking, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line/Directional detection, Audio detection, Sound classification, Shock detection.
 - m. Audio In: Selectable (mic in/line in), Supply voltage: 2.5VDC (4mA), Input impedance: 2K Ohm
 - n. H.265/H.264: Maximum 60fps, MJPEG: Maximum 30fps
 - o. Multiple streaming (Up to 10 profiles)
 - p. Shall support ONVIF Profile S/G/T
 - q. Edge Storage: Micro SD/SDHC/SDXC 1slot maximum 512GB
 - r. 12 VDC or POE
 - s. Operating Temperature Range -13° F to 140° F (-25° C to 60° C).
 - t. Camera shall be XND-6081V or approved equal
3. Type 2-Outdoor Mini Dome, Surface Mounted 2 MP:
- a. Camera shall incorporate a modular design having the mounting plate, camera case, camera module and dome cover being separate components. The camera module shall magnetically attach to the camera case and be interchangeable between camera models.
 - b. Rugged, High-Impact and Vandal Resistant, Puncture Proof Domes
 - c. Tamper-Resistant Hardware
 - d. Minimum Illumination: Color: 0.015Lux (F1.4, 1/30sec), BW: 0Lux (IR LED on)
 - e. Motorized Varifocal Lens of 2.8 mm to 12.0 mm with Auto Iris
 - f. Angular Field of View
 - 1) H: 119.5°(Wide)~27.9°(Tele)
 - 2) V: 62.8°(Wide)~15.7°(Tele)
 - 3) D: 142.1°(Wide)~32.0°(Tele)
 - g. Manual Pan / Tilt / Rotate Range: 0°~360° / -45°~85° / 0°~355°
 - h. IR Viewable Length: 50m (164.04ft)
 - i. Resolution: 2.0 Megapixel (1945 X 1097)
 - j. Digital Image Stabilization – built-in gyro sensor
 - k. Shall be a true Day/Night camera with Wide Dynamic Range (WDR)
 - 1) Day & Night: Auto (ICR)
 - 2) Wide Dynamic Range: 150dB
 - l. Privacy Masking: 32ea, polygonal zones
 - m. Analytics: Defocus detection, Fog detection, Face detection, Motion detection, Digital auto tracking, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line/Directional detection, Audio detection, Sound classification, Shock detection.
 - n. Audio In: Selectable (mic in/line in), Supply voltage: 2.5VDC (4mA), Input impedance: 2K Ohm
 - o. H.265/H.264: Maximum 60fps, MJPEG: Maximum 30fps
 - p. Multiple streaming (Up to 10 profiles)
 - q. Shall support ONVIF Profile S/G/T

- r. Edge Storage: Micro SD/SDHC/SDXC 1slot maximum 512GB
 - s. 12 VDC or POE
 - t. Operating Temperature Range -13° F to 140° F (-25° C to 60° C).
 - u. Exterior wall mounted locations shall include all compatible wall mount accessories.
4. Camera shall be XNV-6081R or approved equal
5. Type 3-Outdoor Mini Dome, 5 MP:
- a. Camera shall incorporate a modular design having the mounting plate, camera case, camera module and dome cover being separate components. The camera module shall magnetically attach to the camera case and be interchangeable between camera models.
 - b. Rugged, High-Impact and Vandal Resistant, Puncture Proof Domes
 - c. Tamper-Resistant Hardware
 - d. Minimum Illumination: Color: 0.07Lux (F1.2, 1/30sec), BW: 0Lux (IR LED on)
 - e. Motorized Varifocal Lens of 3.9 mm to 9.4 mm with Auto Iris
 - f. Angular Field of View
 - 1) H: 92.1°(Wide)~38.7°(Tele)
 - 2) V: 67.2°(Wide)~29.0°(Tele)
 - 3) D: 119.9°(Wide)~48.6°(Tele)
 - g. Manual Pan / Tilt / Rotate Range: 0°~360° / -45°~85° / 0°~355°
 - h. IR Viewable Length: 50m (164.04ft)
 - i. Resolution: 2.0 Megapixel (1945 X 1097)
 - j. Digital Image Stabilization – built-in gyro sensor
 - k. Shall be a true Day/Night camera with Wide Dynamic Range (WDR)
 - 1) Day & Night: Auto (ICR)
 - 2) Wide Dynamic Range: 120dB
 - l. Privacy Masking: 32ea, polygonal zones
 - m. Analytics: Defocus detection, Fog detection, Face detection, Motion detection, Digital auto tracking, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line/Directional detection, Audio detection, Sound classification, Shock detection.
 - n. Audio In: Selectable (mic in/line in), Supply voltage: 2.5VDC (4mA), Input impedance: 2K Ohm
 - o. H.265/H.264: Maximum 30fps, MJPEG: Maximum 30fps
 - p. Multiple streaming (Up to 10 profiles)
 - q. Shall support ONVIF Profile S/G/T
 - r. Edge Storage: Micro SD/SDHC/SDXC 1slot maximum 512GB
 - s. 12 VDC or POE
 - t. Operating Temperature Range -13° F to 140° F (-25° C to 60° C).
 - u. Exterior wall mounted locations shall include all compatible wall mount accessories.
 - v. Camera shall be XNV-8081R or approved equal
6. Type 4- Corner Mounted 3 MP:
- a. Fully Integrated Enclosure with Camera and Lens
 - b. Anti-ligature design & secure installation for corrections
 - c. Rugged, High-Impact and Vandal Resistant, Puncture Proof Domes
 - d. Tamper-Resistant Hardware
 - e. Minimum Illumination: Color: 0.3 lux (F2.0, 1/30sec) / B/W: 0 lux (F2.0, 1/30sec)
 - f. Focal Length Lens of 2.8mm Fixed
 - g. Angular Field of View
 - 1) H: 102°
 - 2) V: 75°
 - 3) D: 129°
 - h. IR Viewable Length: 10m (32.8ft) with 940nm IR LED
 - i. Resolution: 3.0 Megapixel, 2048 x 1536
 - j. Shall be a true Day/Night camera with Wide Dynamic Range (WDR)
 - 1) Auto (ICR)
 - 2) Wide Dynamic Range: 120dB
 - k. Privacy Masking: 32ea, Polygonal

- l. Analytics: Tampering, Loitering, Directional/Virtual line detection, Defocus detection, Fog detection, Enter/Exit, Appear/Disappear, Audio detection, Face detection, Motion detection, Digital auto tracking, Sound classification, Shock detection
 - m. Audio In: Selectable (mic in/line in), Supply voltage: 2.5VDC (4mA), Input impedance: 2K Ohm
 - n. Audio out: Line out, Maximum output level: 1 Vrms
 - o. H.265/H.264/MJPEG: Maximum 30fps at all resolutions
 - p. Multiple streaming (Up to 10 profiles)
 - q. Shall support ONVIF Profile S/G
 - r. Edge Storage: microSD/SDHC/SDXC 1slot (up to 256 GB)
 - s. 12 VDC or POE
 - t. Operating Temperature Range +14°F to 131° F (-10°C to 55° C).
 - u. Camera shall be TNV-7010RC or approved equal
7. Type 5- 12 MP Fisheye:
- a. Fully Integrated Enclosure with Camera and Lens
 - b. Rugged, High-Impact and Vandal Resistant, Puncture Proof Domes
 - c. Tamper-Resistant Hardware
 - d. Ultra-wide angle lens that produces videos in wide angels of view and provides on-board dewarping to convert hemispherical images into rectangular images
 - e. Minimum Illumination: Color: 0.039Lux (F2.2, 1/30sec), B/W: 0Lux (IR LED on)
 - f. Focal Length Lens of 1.08mm Fixed / F2.2
 - g. Stereo graphic type lens, enhanced resolution for the peripheral regions
 - h. Angular Field of View
 - 1) H: 187°
 - 2) V: 187°
 - 3) D: 187°
 - i. IR Viewable Length: 10m (32.8ft)
 - j. Resolution: 12.0 Megapixel, 4000 x 3000
 - k. Resolution Selections:
 - 1) Original view(1:1): 3008x3008~480x480
 - 2) Double panorama(2:1): 3584x1792~640x320
 - 3) Single panorama(4:1): 3584x896~640x160
 - 4) Quad view: 3584x2688~640x480
 - l. Shall be a true Day/Night camera with Wide Dynamic Range (WDR)
 - 1) Wide Dynamic Range: 120dB
 - m. Privacy Masking: 32ea, Polygonal
 - n. Intelligence and Analytics – The camera shall have a suite of intelligent analytic functions.
 - 1) Motion detection with 8 definable detection areas with 8 point polygonal zones, and minimum/maximum object size.
 - 2) Detection of logical events of specified conditions from the camera's video
 - a) Defocus detection
 - b) Directional detection
 - c) Motion detection
 - d) Appear/Disappear
 - e) Enter/Exit
 - f) Loitering
 - g) Tampering
 - h) Virtual line
 - i) Audio detection
 - j) Sound classification
 - 3) Detection and classification of the following sound.

- a) Scream
 - b) Gunshot
 - c) Explosion
 - d) Crashing glass
- o. Audio In: Selectable (mic in/line in), Supply voltage: 2.5VDC (4mA), Input impedance: 2K Ohm
- p. Built-in mic
- q. Audio out: Line out, Maximum output level: 1 Vrms
- r. H.265/H.264: Main/Baseline/High, MJPEG
- s. Multiple streaming (Up to 10 profiles)
- t. Shall support ONVIF Profile S/G/T
- u. Edge Storage: SD/SDHC/SDXC (up to 1TB Max)
- v. 12 VDC or POE
- w. Operating Temperature Range -40°F to 140° F (-40°C to +60° C).
- x. Exterior wall mounted locations shall include a compatible wall mount.
- y. Camera shall be XNF-9010RVM or approved equal
- 8. Type 6- 2x 2MP Dual-Sensor Multi-directional:
 - a. The Vandal Resistant Multi-Directional camera shall have a microSD card slot that uses standard; off-the-shelf microSD (SDHC and SDXC) cards for local storage (up to 512 GB) and be enclosed in a cast-aluminum housing with an aluminum trim ring and a clear polycarbonate dome bubble (with UV blocking anti-scratch coating) and a hardened inner liner and be capable of operating in an indoor or an outdoor environment.
 - b. The camera shall provide multi directional view and produce video in various view modes. The lenses shall be selectable depending on customer's requirement at site.
 - 1) Lenses shall be available in the following focal lengths:
 - a) 2.4mm
 - b) 2.8mm
 - c) 3.6mm
 - d) 6.0mm
 - c. Video
 - 1) Video Compression: H.265, H.264, MJPEG, Multiple streaming
 - 2) Resolution: Dual 1080P (1920x1080) Sensors
 - 3) Frame Rate: H.265/H.264: Maximum 60fps
 - 4) Dynamic Range: Wide Dynamic Range, 150dB
 - 5) Digital Noise Reduction: SSNR
 - d. Minimum Illumination:
 - 1) 2.4mm - Color: 0.055Lux (F2.0, 1/30sec)
 - 2) 2.8mm - Color: 0.055Lux (F2.0, 1/30sec)
 - 3) 3.6mm - Color: 0.055Lux (F2.0, 1/30sec)
 - 4) 6.0mm - Color: 0.055Lux (F2.0, 1/30sec)
 - e. Imager: 1/2.8" 2MP CMOS
 - f. Optical
 - 1) Viewing Angle:
 - a) 2.4mm - H:135.4°, V:71.2°, D:161.6°
 - b) 2.8mm - H:107.4°, V:62.2°, D:122.0°
 - c) 3.6mm - H: 94.8°, V: 49.3°, D: 114.3°
 - d) 6.0mm - H: 50.4°, V: 28.8°, D: 58.1°
 - g. Application Programming Interface: ONVIF Profile S/G/T SUNAPI (HTTP API)
 - h. Mechanical
 - 1) Dome: Polycarbonate, clear, UV-blocking anti-scratch, IK10 Impact Resistance
 - 2) Camera Body: Aluminum
 - 3) Pan / Tilt / Rotate Range: -176°~+176° / 0°~30° / -90°~+90°
 - i. Camera shall be PNM-7002VD with applicable lens modules or approved equal
- 9. Type 7- Indoor 4x 5MP Multi-Sensor Multi-directional:

- a. The Vandal Resistant Multi-Sensor/Multi-Directional camera shall have a microSD card slot that uses standard; off-the-shelf microSD (SDHC and SDXC) cards for local storage (4 slots, 1 ea. per channel) and be enclosed in a cast-aluminum housing with an aluminum trim ring and a clear polycarbonate dome bubble (with UV blocking anti-scratch coating) and a hardened inner liner and be capable of operating in an indoor or an outdoor environment.
 - b. The camera shall provide 360-degree field of view and produce video in quad view mode. The fixed lenses/sensors shall be selectable depending on customer's requirement at site. Lenses provided shall provide a full 360° with the maximum vertical FoV.
 - c. Lenses/Sensors shall be available in the following resolutions and focal lengths:
 - 1) 5 MP – 3.7mm
 - 2) 5 MP – 4.6mm
 - 3) 5 MP – 7mm
 - d. Power:
 - 1) Input Voltage / Current: PoE+ (IEEE802.3at, Class4)
 - 2) Power Consumption: Maximum 25.5W
 - e. Video
 - 1) Video Compression: H.265, H.264, MJPEG, Multiple streaming
 - 2) Frame Rate: H.265/H.264: 5 MP 30fps
 - 3) Dynamic Range: Wide Dynamic Range, 120dB
 - 4) Digital Noise Reduction: SSNR5 (2D + 3D noise filter) (On / Off)
 - f. Minimum Illumination:
 - 1) Color: 0.16Lux (F1.6, 1/30sec, 30IRE)
 - 2) B/W: 0.16Lux (F1.6, 1/30sec, 30IRE)
 - g. Imager:
 - 1) 1/1.8" 5MP CMOS
 - h. Optical
 - 1) Viewing Angle:
 - a) 5 MP – 3.7mm-H:97.5°, V:71.9°, D:126.2°
 - b) 5 MP – 4.6mm-H:77.9°, V:57.9°, D:98.7°
 - c) 5 MP – 7mm-H:50.7°, V:37.8°, D:63.8°
 - i. Application Programming Interface: ONVIF Profile S, SUNAPI (HTTP API)
 - j. Pan / Tilt / Rotate Range:
 - 1) 5 MP – 3.7mm- -90°~+90° / +36°~+73° / -180°~+180°
 - 2) 5 MP – 4.6mm- -90°~+90° / +21°~+85° / -180°~+180°
 - 3) 5 MP – 7mm- -90°~+90° / +12°~+93° / -180°~+180°
 - k. Camera shall be PNM-9002VQ or approved equal
10. Type 8-Exterior 8 MP Multi Sensor:
- a. Fully Integrated Enclosure with multiple Camera Sensors and Lenses
 - b. Rugged, High-Impact and Vandal Resistant, Puncture Proof Domes
 - c. Tamper-Resistant Hardware
 - d. Field of View: 360-degree and producing video in quad view mode.
 - e. Minimum Illumination: Color: 0.05 Lux (F1.6,30 IRE), B/W: 0Lux (IR LED on)
 - f. Remotely adjustable Pan, Tilt, Zoom & Rotate Motorized Lenses of 3.2 ~ 10mm with Auto Iris
 - g. Angular Field of View
 - 1) H: 109.0°(Wide) ~ 33.2°(Tele)
 - 2) V: 57.4°(Wide) ~ 18.7°(Tele)
 - 3) D: 132.0°(Wide) ~ 38.0°(Tele)
 - h. Resolution: 1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600,800x448, 720x576, 640x480, 640x360, 320x240
 - i. Shall be a true Day/Night camera with Wide Dynamic Range (WDR)
 - 1) Auto (ICR)
 - 2) Wide Dynamic Range: 120dB
 - j. Privacy Masking: 32ea, Polygonal
 - k. Intelligent Video Analytics: Defocus detection, Directional detection, Fog detection, Face detection, Motion detection, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line, Audio detection

- l. H.265/H.264: Max. 60fps at all resolutions, Motion JPEG: Max. 30fps
 - m. Multiple streaming (Up to 10 profiles)
 - n. Shall support ONVIF Profile S/T
 - o. Edge Storage: Micro SD/SDHC/SDXC 4slots 256GB(each CH)
 - p. 12 VDC or POE
 - q. Operating Temperature Range -40°F to 131° F (-40°C to 55° C).
 - r. Exterior wall mounted locations shall include a compatible wall mount.
 - s. Camera shall be PNM-9084RQZ or approved equal
11. Type 9-Exterior 20 MP Multi Sensor:
- a. Fully Integrated Enclosure with multiple Camera Sensors and Lenses
 - b. Rugged, High-Impact and Vandal Resistant, Puncture Proof Domes
 - c. Tamper-Resistant Hardware
 - d. Field of View: 360-degree and producing video in quad view mode.
 - e. Minimum Illumination: Color: 0.07 Lux (F1.2, 1/30sec), B/W: 0.007 Lux (F1.2, 1/30sec)
 - f. Remotely adjustable Pan, Tilt, Zoom & Rotate Motorized Lenses of 3.6 ~ 9.4mm with Auto Iris
 - g. Angular Field of View
 - 1) H: 102.5°(Wide) ~ 38.7°(Tele)
 - 2) V: 74.2°(Wide) ~ 29.0°(Tele)
 - 3) D: 135.5°(Wide) ~ 48.6°(Tele)
 - h. Resolution: 2560x1920, 2560x1440, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
 - i. Shall be a true Day/Night camera with Wide Dynamic Range (WDR)
 - 1) Auto (ICR)
 - 2) Wide Dynamic Range: 120dB
 - j. Privacy Masking: 32ea, Polygonal
 - k. Intelligent Video Analytics: Defocus detection, Directional detection, Fog detection, Face detection, Motion detection, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line, Audio detection
 - l. H.265/H.264: Max. 30fps/25fps (60Hz/50Hz) at all resolutions
 - m. Multiple streaming (Up to 10 profiles)
 - n. Shall support ONVIF Profile S/T
 - o. Edge Storage: Micro SD/SDHC/SDXC 4slotsmaximum 256GB each, per channel
 - p. 12 VDC or POE
 - q. Operating Temperature Range -40°F to 131° F (-40°C to 55° C).
 - r. Exterior wall mounted locations shall include a compatible wall mount.
 - s. Camera shall be PNM-9085RQZ or approved equal
12. Type 10-Exterior 2 MP PTZ High- Performance Integrated Dome Systems:
- a. Auto Focus with Manual Override
 - b. 40X Optical Zoom
 - c. Pan / Tilt Speed: Max. 700%/sec, Manual : 0.024%/sec ~ 250%/sec
 - d. Pan Range: 360° Endless
 - e. Tilt Range: 110° Endless (-20° ~ 90°)
 - f. Presets: 300 ea.
 - g. Minimum Illumination: Color: 0.05Lux (F1.6, 1/30sec), B/W : 0.0Lux (IR LED On)
 - h. IR Viewable Length: 200m(656.17ft)
 - i. Angular Field of View
 - 1) H: 65.66°(Wide) ~ 1.88°(Tele)
 - 2) V: 39.40°(Wide) ~ 1.09°(Tele)
 - j. Resolution: 1920 x 1080, 1280 x 1024, 1280 x 960, 1280 x 720, 1024 x 768, 800 x 600, 800 x 448, 720 x 576, 720 x 480, 640 x 480, 640 x 360, 320 x 240
 - k. Wide Dynamic Range (WDR): 150dB
 - l. Digital Image Stabilization: Off / On (Built-in Gyro sensor)
 - m. Defog: Off / Auto / Manual
 - n. Privacy Masking: 32ea, Rectangular
 - o. Intelligent Video Analytics: Directional detection, Fog detection, Face detection, Motion detection, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line, Shock detection

- p. Multiple streaming (Up to 10 profiles)
 - q. Shall support ONVIF Profile S/G
 - r. Edge Storage: MicroSD/SDHC/SDXC 2 slots (up to 1TB)
 - s. Operating Temperature Range -40°F to 131° F (-40°C to 55° C).
 - t. Pole mounted units and/or units mounted separate from the building shall be routed via fiber. Contractor to provide appropriate fiber transmission equipment for complete and successful operation.
 - u. Camera shall be XNP-6400R or approved equal
13. Ceiling Mounted Security Microphone (external specifications if internal camera microphone not utilized)
- a. Microphone type – Electret Condenser
 - b. Output - Line Level (0dB @1KΩ), unbalanced
 - c. Frequency response - 40 Hz to 15 kHz ± 1 dB
 - d. Current drain - 4 mA
 - e. Supply voltage - 12Vdc, 500mA
 - f. Dimensions - 4"dia x 1 ½"H
 - g. Sturdy ABS housing
 - h. Microphone shall be Louroe Verifac "A"
- E. All camera installations shall be securely attached to mounting surface. Use lead shields on solid masonry, toggle bolts for hollow masonry, and machine bolts for steel. All anchoring devices shall be rated to support not less than five times the total equipment weight.
- F. Video Surveillance Monitors:
- 1. Video Surveillance Monitors shall be the standard products of one manufacturer and compatible with the total system specified, herein, and complying with these specifications. Monitors and cameras shall be provided by the same manufacturer.
 - 2. Surveillance Monitors shall be LED flat panel type as indicated on the drawings and as specified herein. All monitors shall be U.L. listed.
 - 3. Twenty-Four (24) inch monitors shall be mounted as shown on the drawings. Monitors shall comply with not less than the following specifications:
 - a. LED Panel Resolution: 1920 x 1080
 - b. Panel Aspect Ratio 16:10
 - c. Pixel Pitch 0.270 x 0.270mm
 - d. Contrast Ratio 1000:1
 - e. Viewing Angle (H/V) 178°/178°
 - f. Response Time 4 ms
 - 4. Thirty-Two (32) inch monitors shall be mounted as shown on the drawings. Monitors shall comply with not less than the following specifications:
 - a. LED Panel Resolution: 2560 x 1440
 - b. Panel Aspect Ratio 16:9
 - c. Pixel Pitch 0.276 x 0.276mm
 - d. Contrast Ratio 3000:1
 - e. Viewing Angle (H/V) 178°/178°
 - f. Response Time 5 ms
 - 5. Forty-Three (43) inch monitors shall be mounted as shown on the drawings. Monitors shall comply with not less than the following specifications:
 - a. LED Panel Resolution: 3840 x 2160
 - b. Panel Aspect Ratio 16:9
 - c. Pixel Pitch 0.276 x 0.276mm
 - d. Contrast Ratio 4,700:1
 - e. Viewing Angle (H/V) 178°/178°
 - f. Response Time 8 ms
 - 6. Fifty (50) inch monitors shall be mounted as shown on the drawings. Monitors shall comply with not less than the following specifications:
 - a. LED Panel Resolution: 3840 x 2160
 - b. Panel Aspect Ratio 16:9
 - c. Pixel Pitch 0.276 x 0.276mm

- d. Contrast Ratio 4,700:1
- e. Viewing Angle (H/V) 178°/178°
- f. Response Time 8 ms
- G. Client Workstations:
 - 1. Remote monitoring environment for video and audio over the network.
 - 2. Unit shall be able to display any camera on any monitor over the network.
 - 3. Ability to incorporate graphic map features to depict camera locations if required.
 - 4. General Properties:
 - a. Camera search and Discovery:
 - 1) Capable of searching Network Video Recorders for connected cameras.
 - 2) Cameras are Searched or Discovered:
 - a) Camera will be automatically viewed and current camera information (fps, days of recording) displayed.
 - b. Support up to four monitor outputs.
 - c. Recording and Playback Functions:
 - 1) Simultaneous playback capability up to 128 video channels of resolutions of (4 cif to 12 MPS).
 - 2) Compression Support: CoH.265, H.264, and MJPEG.
 - 3) View AAC, PCM, g726, and MPS audio.
 - 4) Set recording schedules.
 - 5) Set up triggered recording based on:
 - a) Sensor (input) detection.
 - b) Camera event, analytics based in Wisenet Cameras.
 - c) Motion detection.
 - d) Video loss detection.
 - 6) Available recording settings that can be set up or changed by channel for standard and event-based recording types:
 - a) Compression type.
 - b) Resolution.
 - c) Images per second.
 - d) Quality.
 - e) Data transfer limit.
 - f) Pre-event and post-event record duration.
 - g) I-frame and full frame recording.
 - 7) Search recorded data by time, event trigger, motion alarms, events
 - d. Storage: 1x 256GBSSD.
 - 1) USB connection for export device for video clip backup and settings export.
 - e. Live View:
 - 1) Remote monitoring.
 - 2) Streams: H.265, H.264, MJPEG.
 - 3) Offline Media: AVI, MKV, MP4, MOV, TS, M2TS, MPEG, MPG, FLV, WMV, 3GP, JPG, PNG, GIF, BMP, and TIFF.
 - 4) Configure and exercise functions for connected PTZ cameras, including functionality with compatible USB joystick.
 - 5) Capture and save snapshot images.
 - f. Up to Four High Definition local monitor outputs live viewing, playback, and backup functions.
 - g. ONVIF Profile S compliance.
 - 5. System:
 - a. Processor: Intel® Core™ i7-9100 3.6Ghz to 4.2Ghz (4Cores, 4Threads, 6MB).
 - b. Memory: 16 GB DDR4.
 - c. Operating Systems: Windows 11 Professional.
 - d. USB Ports: Rear: (2) USB 3.1 Gen 1, (2) USB 2.0; Front: (2) USB 3.1 Gen 1, (2) USB 2.0.
 - e. Video Output: 3x Mini DisplayPort with 2x HDMI adapters.
 - f. Other Ports: 1x PS2, 3.5 mm audio in/out, 1x SPDIF out.
 - g. Keyboard and Mouse: Included.
 - 6. Video Compression: H.265, H.264, and MJPEG.

7. Events and Response Actions:
 - a. Triggers:
 - 1) Motion.
 - 2) Video loss.
 - 3) Event defined by camera.
 - b. Response Actions:
 - 1) Record.
 - 2) E-mail.
 - 3) Activate PTZ preset.
 - 4) Event trigger program.
 - 5) Sound output.
8. Playback:
 - a. Number of simultaneous channels: Not limited.
9. Network:
 - a. Connectivity: 1000 Base-T Ethernet, 2 x RJ-45 connectors.
 - b. Protocols Supported:
 - 1) Transmission Control Protocol (TCP), Internet Protocol (IP) v4 and v6, User Datagram Protocol (UDP).
 - 2) Configuration: Dynamic Host Configuration Protocol (DHCP).
 - 3) Web Services: Hypertext Transfer Protocol (HTTP), Secure HTTP (HTTPS).
 - 4) Network Services: Address Resolution Protocol (ARP), Domain Name System (DNS), Internet Control Message Protocol (ICMP), Network Time Protocol (NTP), Simple Network Management Protocol (SNMP v1/2c/3 - MIB-2), Universal Plug and Play (UPnP).
 - 5) Media: Real-Time Transport Protocol (RTP), Real-Time Control Protocol, Real-Time Streaming Protocol (RTSP).
 - 6) Multicast: Internet Group Management Protocol (IGMP).
 - 7) Notifications: Simple Mail Transfer Protocol (SMTP).
 - 8) Remote Access: Point-to-Point Protocol over Ethernet (PPPoE).
 - c. Security Features:
 - 1) User password protection with group restrictions.
 - 2) User access log.
10. Audio:
 - a. Direction: Bi-directional.
 - b. Compression: AAC (16/48 KHz), G.711 u-law, G.726 selectable.
 - c. Output: Line level (RCA).
11. Electrical:
 - a. Power: 100 to 240 VAC.
 - b. Power Supply: 250 W.
12. Environmental:
 - a. Mouse and Keyboard: Included.
 - b. Temperature; Operating and Storage: 32 to 122 degrees F (0 to 50 degrees C).
 - c. Humidity: 5 to 85 percent, RH non-condensing.
- H. Rackmount Servers:
 1. Network Video Recorder ("NVR"):
 - a. Record Video and Audio: 470 Mbps
 - b. Send data from video cameras to a hard disk array of 1 to 12 HDDs within a rack mountable format and enable playback of video and audio from the hard disk array.
 - 1) Pre-configured with the VMS.
 - 2) Remote monitoring environment for video and audio over network using a remote computer.
 - c. General Properties:
 - 1) Camera Search and Discovery: Search network for connected compatible cameras via Onvif Profile S or the manufacturer's native driver.
 - a) Cameras are Searched or Discovered:
 - (1) Cameras automatically registered and current camera information (fps, days of

- recording) displayed.
- (2) Ability to selectively register as many as cameras can be found.
- 2) Support dual monitor out.
- 3) Support server backup if multiple servers are in the hive for failover for redundancy.
- 4) Recording and Playback Functions:
 - a) Support recording 128 dual streams (256 streams) from 352 x 288 (CIF) up to 4000 X 3000 (12 MP) per channel.
 - b) 470 Mbps network camera recording throughput.
 - c) Simultaneous Playback Capability: 128 video channels.
 - d) Compression Support: H.265, H.264, and MJPEG.
 - e) NVR to record and stream AAC, PCM, g726, and MPS audio.
 - f) View status of internal connected storage hardware.
 - g) Set recording schedules.
 - h) Set up triggered recording based on:
 - (1) Sensor (input) detection.
 - (2) Camera event, analytics based in the manufacturer's cameras.
 - (3) Motion Detection.
 - (4) Video loss detection.
 - i) Available recording settings by channel for standard and event-based recording types:
 - (1) Compression type.
 - (2) Resolution.
 - (3) Images per second.
 - (4) Quality.
 - (5) Data transfer limit.
 - (6) Pre-event and post-event record duration.
 - (7) I-frame and full frame recording.
 - j) Available actions upon reaching full HDD storage capacity:
 - (1) Stop recording.
 - (2) Overwrite.
 - k) Search recorded data by time, event trigger, motion alarms, events.
- 5) Storage:
 - a) JBOD configuration for a maximum of 96 TB.
 - b) RAID Support: RAID 0/1/5/6/10/50/60 plus BBU (backup battery unit).
 - c) USB connection for memory/storage device for video clip backup and settings export.
- 6) Live View:
 - a) Remote monitoring using the manufacturer's supplied viewer.
 - b) Streams: H.265, H.264, MJPEG.
 - c) Offline Media: AVI, MKV, MP4, MOV, TS, M2TS, MPEG, MPG, FLV, WMV, 3GP, JPG, PNG, GIF, BMP, and TIFF.
 - d) Configure and exercise functions for connected PTZ cameras, including functionality with compatible USB joystick.
 - e) Capture and save snapshot images.
 - f) Record current video in AVI format.
- 7) Remote Access:
 - a) Multicast or Unicast: Simultaneous access is unlimited.
 - b) Mobile Device:
 - (1) Supported Platforms:
 - (a) Android.
 - (b) IOS.
 - (2) Supported Remote Users: Unlimited amount either live or playback.
 - (3) Dynamic DNS (DDNS) support.
- 8) VGA and High Definition (HDMI) local monitor outputs live viewing, playback, and backup functions.
- 9) ONVIF Profile S compliance.

- 10) Alarm Connections: None on server. Use of I/O software module to support I/O control.
- d. System:
 - 1) Processor: Intel Dual Xeon Silver 8 Core/16 threads.
 - 2) Memory: 16 GB DDR4
 - 3) Operating Systems: Windows Server 2019 standard
 - 4) OS on Raid 1 2 SSD drives.
 - 5) Storage on Raid 5 drives.
 - 6) USB Ports: 6x USB 3.0 (rear), 2x USB 3.0 (front).
 - 7) Video Output: 1x Display Port (rear), 1x HDMI (rear), 1x DVI (rear).
 - 8) Other ports: 3.5 mm audio in/out, 1x SPDIF out.
 - 9) Keyboard and Mouse: Included.
 - 10) Sliding Rail Kit: Included.
- e. Video Compression: H.265, H.264, MJPEG.
- f. Recording:
 - 1) Channel Capability: No limit but recommended to use the manufacturer's storage Calculator.
 - 2) Bit Rate: 470 Mbps.
 - 3) Resolution Range: 352 x 288 to 4000 X 3000.
- g. Events and Response Actions:
 - 1) Triggers:
 - a) Motion.
 - b) Video loss.
 - c) Event defined by camera.
 - 2) Response Actions:
 - a) Record.
 - b) E-mail.
 - c) Activate PTZ preset.
 - d) Event Trigger program.
 - e) Sound output.
- h. Playback:
 - 1) Number of simultaneous channels: Not limited.
 - 2) Bandwidth: 470 Mbps.
- i. OS Drive: OS Drive Bays: 1 to 256 GB SSD internally mounted.
- j. Storage:
 - 1) Internal:
 - a) Number of HDDs Bays: 1 to 12 Bays.
 - b) Capacity per HDD: 1 to 8 TB.
 - c) RAID 0/1/5/6/10/50/60 plus BBU (backup battery unit).
 - 2) External Types: USB HDD/Flash drive for backup of video clips, firmware update, settings backup/restore, log export.
- k. Network:
 - 1) Connectivity: 1000 Base-T Ethernet, 2 x RJ-45 connectors.
 - 2) Protocols Supported:
 - a) Transmission Control Protocol (TCP), Internet Protocol (IP) v4 and v6, User Datagram Protocol (UDP).
 - b) Configuration: Dynamic Host Configuration Protocol (DHCP).
 - c) Web Services: Hypertext Transfer Protocol (HTTP), Secure HTTP (HTTPS).
 - d) Network Services: Address Resolution Protocol (ARP), Domain Name System (DNS), Internet Control Message Protocol (ICMP): Network Time Protocol (NTP), Simple Network Management Protocol (SNMP v1/2c/3 - MIB-2), Universal Plug and Play (UPnP).
 - e) Media: Real-Time Transport Protocol (RTP), Real-Time Control Protocol, Real-Time Streaming Protocol (RTSP).
 - f) Multicast: Internet Group Management Protocol (IGMP).
 - g) Notifications: Simple Mail Transfer Protocol (SMTP).
 - h) Remote Access: Point-to-Point Protocol over Ethernet (PPPoE).

- 3) DDNS: Support DDNS services offered by the Manufacturer and other publicly available service offerings.
- 4) Security Features:
 - a) User password protection with group restrictions.
 - b) IP address filtering, list of allowed or blocked IP addresses.
 - c) HTTPS(SSL) login authentication.
 - d) User access log.
 - e) 802.1x authentication.
 - f) Restriction of network access/web viewer access.
- 5) Discovery: Manufacturer shall offer a discovery program to identify all devices of his manufacture on the network, as well as ONVIF Profile S conformant devices.
- l. Alarm/Sensor Interface:
 - 1) Input (0): NO or NC, selectable.
 - 2) Output (0): NO or NC, selectable.
 - 3) Use of I/O software module to support I/O control.
- m. Audio:
 - 1) Direction: Bi-directional.
 - 2) Compression: AAC (16/48 KHz), G.711 u-law, G.726 selectable.
 - 3) Output: Line level (RCA).
 - 4) Output: Line level (RCA).
- n. Electrical:
 - 1) Power: 100 to 240 VAC.
 - 2) Power Supply: 800 W Redundant.
- o. Mechanical and Environmental:
 - 1) Color: Black / metal.
 - 2) Front Bezel and lock.
 - 3) Form Factor 2U Rack Mount Chassis. Sliding rails included.
 - 4) Mouse and Keyboard: Included.
 - 5) Dimensions (W x H x D): 17.2 x 3.5 x 26 inch (438 x 87.0 x 660 mm).
 - 6) Weight: 30.86 lbs. (14 kg).
 - 7) Temperature; Operating and Storage: 32 to 122 degrees F (0 to 50 degrees C).
 - 8) Humidity: 5 to 85 percent, RH non-condensing.

2.02 VIDEO MANAGEMENT SYSTEMS (VMS)

- A. Video Management Systems: For remote devices and sensors.
 - 1. Software: Wisenet Wave v4.2 as manufactured by Hanwha Techwin America or preapproved equal.
 - 2. System Requirements:
 - a. Open video platform designed for use in any video application.
 - b. Specified Software: To include, free of charge, any API or SDKs necessary to integrate third party devices and systems.
 - c. Shall include a UART Bridge that will allow serial protocol communications to interface to HMI Software platforms. Interface shall allow the automatic call-up of cameras to tiles within designated monitors for functions such as Intercom Station video follow audio, alarm conditions and spot monitor camera call-up from Touch Screen Icons.
 - d. Specified Video Management Solution's Architecture: To include Desktop, Media Server, as well as the capability of Mobile, and Cloud applications.
 - 3. Software Components Characteristics: Four applications working seamlessly together.
 - a. Cloud Application (if required): Enables simple remote connectivity, viewing, and management of an unlimited number of systems and users.
 - b. Media Server Application: Responsible for discovering, connecting to, and managing system users, devices, and associated data.
 - c. Desktop Application: Capable of acting as a stand-alone media player or as a client application for connecting to and managing systems.
 - d. Mobile Application (if required): For iOS and Android devices that allows users to connect to, view, search, and control IP cameras over Wifi or Data networks.
 - 4. Built-In Developer and Integration Tools: Accessible from System Server's Web Admin Interface (compatible with all major browsers).

- a. Generic Events Generator: Tool which builds HTTP Generic Event calls; a method of sending events from third party systems to the VMS, which can be used to trigger system actions in the VMS.
 - b. Server API: SUNAPI implementation giving developers the ability to access every system feature available.
 - c. API Change Log: List of breaking changes in API from version to version.
 - d. Video Source Integration SDK: Integrate virtually any live or recorded video source (IP Cameras, NVRs, DVRs, etc.) into the VMS with methods for discovering, displaying, analyzing and recording video, as well as integrating device I/O ports and related motion detection information.
 - e. Storage SDK: Integrate potential storage into System. Allow developers to read from or write to any storage location; local, remote, or cloud-based (if required). Require implementing standard functions such as: I/O stream, if file exists, delete file, list of files in the folder, etc. Capable of using an FTP server as a storage location.
5. System Architecture:
- a. Server Hive Architecture:
 - 1) System servers are equal synchronizing system databases in real-time.
 - 2) Users can connect to any system server to see and manage entire system.
 - 3) Servers support automatic camera failover ensuring limited loss of video recording in event of hardware or network failure.
 - 4) Servers use SQLite included in installation package.
 - b. One-click System Wide Updates:
 - 1) System Administrators Capabilities:
 - a) Upgrade entire system via single button in Desktop Application.
 - b) Upgrade on demand to latest release or specific builds with specific functionality or bug fixes.
 - c) Apply an OTA (over-the-air) update.
 - d) Generate a URL to download a portable system-specific update package in 'Zip' file format which can be used to update servers without an active Internet connection.
 - c. Use secure technologies for inter-application communication and security.
 - 1) OpenSSL for Network Connections: Deprecated and insecure protocols and use only TLS v1plus.
 - 2) Email Server: Client (Mobile, Desktop, Web) Communications - HTTPS Email - TLS / SSL - TLS; default option.
 - 3) Salted/Hashed Passwords: Local credentials protected using a salted MD5 hash, cloud credentials should use a complex multi-level hash.
 - d. The VMS will not require any licenses to increase the number of supported devices, users, or servers.
- B. VMS Server Application:
1. Runs on the Following Operating Systems:
 - a. Microsoft:
 - 1) Windows 10 IoT Enterprise.
 - 2) Windows Server 2019 or later.
 - 3) Windows 10 Enterprise Solutions.
 - b. Ubuntu Linux:
 - 1) Ubuntu 14.04 LTS: Trusty Tahr.
 - 2) Ubuntu 16.04 LTS: Xenial Xerus.
 2. Minimum Compatible Computing Hardware:
 - a. Any hardware able to run a compatible operating system.
 - b. Capable of recording 128 dual-streaming IP cameras (256 streams) on a single core of an Intel Core i3 processor.
 3. Initial Installation and Setup:
 - a. Publicly available, free download.
 - b. No prerequisite proprietary or 3rd party software and database technologies required during installation.
 - c. Installation Process: No user input once initiated.
 - d. After Installation is Complete: Setup process will allow system administrators to create a new

system or to merge newly installed servers with existing systems.

4. Performance:
 - a. Automatically discover, stream, and record any ONVIF Profile S IP camera located on same subnet as server application.
 - b. Manually discover, stream, and record RTSP, HTTP, or UDP (multicast, unicast) streams.
 - c. Concurrent TCP Connections: 1000.
 - d. Record and Stream Video: Any resolution and frame rate, limited only by hardware.
 - e. Automatic camera failover without any additional licenses.
 - f. Unlimited number of users and custom user roles.
 - g. Any type of storage medium - HDDs, SSDs, SD cards, DAS, NAS, or other network-attached storage devices or locations.
 - h. User Login Credential Management: LDAP / Active Directory / Open LDAP integration.
 - i. Record and Stream
 - 1) Video: H.264, H.265, and MJPEG.
 - 2) Audio: AAC, PCM (Mu-Law, A-law), g726, and MP3.
 - j. Transcode Streams on Demand: For delivery to 3rd party system devices.
 - 1) Codecs: H.265, H.264, MJPEG or WebM.
 - k. Pass-through high-res or low-res HLS streams from connected devices.
 - l. Store archive indices in same location as recorded video files.
 - m. Re-Index Archive Feature: Allow system administrators to recover archives from any storage medium.
 - n. Boolean Events Engine: Allow operators to program and trigger system actions based on system, connected device, or HTTP events sent from 3rd party system or device.
 - o. Send HTTP PUT or GET requests to 3rd party systems or devices.
 - p. Support Addressing: IPv4 or IPv6.
 - q. Operators to set custom network routing configurations for system servers to optimize network routing and usage.
 - r. Allow operators to monitor CPU, RAM, NIC, and HDD usage in real time.
 - s. Track all operator actions to allow audits.
 - t. Generate automatic crash files for every crash of the Server application.
 - u. Operator ability to change size of reserved disk space for storage drives.
 - v. Automatically disable any system drive (drive containing the operating system) in computing hardware with more than one drive to ensure operating system drive does not become full.
 - w. Configuration and events from binary I/O contacts on supported devices including IP cameras and I/O devices.
 - x. Send email notifications via SMTP using TLS, SSL or unsecured connections.
 - y. Scheduled backup of recording archives to local, networked, or cloud storage locations.
 - z. On-demand backup of recording archives to local, networked, or cloud storage locations.
 - aa. Concurrent-recording of all connected cameras / streams to two servers in real-time.
 - bb. Server-side, CPU-based motion analysis for all connected IP cameras with no perceptible increase, less than 3 percent, in CPU usage.
 - cc. Require no dedicated GPU in order to perform at maximum capacity.
 - dd. Web Administration Interface Allowances:
 - 1) System administrators to view real-time server health monitoring statistics; CPU, NIC, and HDD usage.
 - a) Hidden advanced page giving system administrators ability to modify advanced system settings.
 - 2) Users to view live or recorded video from a single camera at a time in high or low resolutions.
 - 3) Users to view all available servers in system.
 - a) Operators to disconnect the VMS Server from the VMS cloud application (if required).
 - b) Operators to switch between server interfaces.
 - 4) Must support any RAID configuration of storage medium.
- C. VMS Desktop Application:
1. Runs on the Following Operating Systems:

- a. Microsoft:
 - 1) Windows 11 Pro.
 - 2) Windows Server 2019.
 - 3) Windows 10 Enterprise Solutions.
- b. Ubuntu Linux:
 - 1) Ubuntu 14.04 LTS: Trusty Tahr.
 - 2) Ubuntu 16.04 LTS: Xenial Xerus.
 - a) Apple / Mac.
 - 3) OSX 10.11: El Capitan.
 - 4) OSX 10.12: Sierra.
 - 5) OSX 10.13: High Sierra.
2. Minimum Compatible Computing Hardware:
 - 1) Any hardware able to run a compatible operating system with a CPU that supports OpenGL 2.1 and Intel HD Graphics 3000 (or higher).
 - b. Will not require any dedicated graphics drive to work at full capacity; 64 streams on a 64 bit OS, 24 streams on a 32 bit OS, and use the CPU for all video decoding and rendering.
3. Installation and Configuration of VMS Client Application:
 - a. Publicly available, free download.
 - b. No prerequisite proprietary or 3rd party software and database technologies required during installation.
 - c. Installation Process: No user input once initiated.
4. Performance and Basis Structure:
 - a. Navigation Panel: Main menu button, an interactive cloud-login icon, tabbed layouts, minimize and maximize icons, a contextual help icon, and a close application icon.
 - b. Resource Panel (Left): Contains all system resources (Servers, Devices, Users, Layouts, Offline files, etc.) with collapsible structure and a keyword search mechanism to allow operators to quickly search for a display live streams / cameras, offline video and image files, or any combination thereof.
 - c. Notifications Panel (Right): Shows all system or rules-engine generated notifications which can be clicked on to display relevant resource in the viewing grid.
 - d. Timeline Panel (Bottom): Allows for navigation and search of recorded video files.
 - e. Viewing Grid (Main Viewing Area): A flexible adaptive grid interface which allows operators to create and share customized layouts of system resources.
5. Operation: Allow operators to do the following.
 - a. View and interact with the following types of media:
 - 1) Live Streams: H.265, H.264, MJPEG.
 - 2) Offline Media: AVI, MKV, MP4, MOV, TS, M2TS, MPEG, MPG, FLV, WMV, 3GP, JPG, PNG, GIF, BMP, and TIFF.
 - 3) I/O Devices: Status and triggers.
 - 4) Servers: Real-time server health monitoring status.
 - b. Scroll to and zoom in on any zone of viewing grid.
 - c. Drag and drop to reassign cameras from one server to another server.
 - d. Via a flexible timeline, view dates of any and all archived video in the System for a specific camera, or groups of cameras.
 - e. Manually Create Bookmarks: With start time, end time, name, description, and tags, for later search. Bookmarks must also be able to be created using the Rules engine.
 - f. Create Soft Triggers: Programmable, customizable buttons which sit on top of streams in Viewing Grid, to trigger any available system action.
 - g. Icons Located on the Top of Live Camera Streams: Dewarp fisheye cameras, control PTZ cameras, apply client-side image enhancement, execute smart motion search, create zoom windows, rotate items to any orientation, and activate stream or file info.
 - h. Create Zoom Windows: 63 zoom windows on a single item in a 64 bit OS, 23 zoom windows in a 32 bit OS; a magnified view of a part of a live stream, recorded videos, or static images.
 - i. Execute a Smart Motion Search: By selecting a subset of a live camera stream with results shown in red on the flexible timeline. Smart Motion search should be able to search a year (12 months, 365 days) of archived video in less than one second.

- j. Search live cameras by name, manufacturer, IP address, MAC address, and status (e.g. live).
- k. Search video archives by date and time with a responsive, adaptive timeline.
- l. Operators to customize the background image of the application with supported image types.
- m. Support digital mapping by allowing operators to add and customize background images including opacity and number of grid points.
- n. Utilize adaptive scaling technology to automatically switch between high and low resolution streams during live and recording playback to optimize CPU and network usage.
- o. Log in to the Cloud application (if utilized) in order to quickly connect to any shared system.
- p. Quickly switch between previously connected or cloud-accessible systems (if utilized) using searchable tiles that show system name and status.
- q. Using a Storage Analytics feature analyze storage capacity of the system based on available drives and real-time and historical bandwidth analysis.
- r. Management and configuration of all system devices, users, and resources in a single unified interface.
- s. Fast-forward and fast-reverse of archived video up to 16x normal speed.
- t. Show operators which system server they are connected to.
- u. Connect to previous versions by automatically downloading and switching to compatible versions.
- v. Automatically discover available systems on the same network as the computer running the Desktop application.
- w. Automatically recover and reconnect to a system in the instance the server the operator is connected to becomes inaccessible for any reason.
- x. Show or hide adaptive thumbnails in the timeline panel.
- y. Synchronize all items on a layout or disable synchronization to view live and recorded video at the same time.
- z. Adaptive settings dialogs, to switch dialog content while the dialog is open by clicking on a resource.
- aa. Batch configuration of camera recording schedules, fps, and quality.
- bb. Drag and drop multiple system resources onto the Viewing Grid at the same time.
- cc. Modify time synchronization settings for the system to utilize online resources (NTP servers) or to set a dedicated local time server.
- dd. View a full list of system cameras and devices in a single dialog.
- ee. View, Search and Export:
 - 1) All system events.
 - 2) All system bookmarks.
 - 3) System logs.
 - 4) Audit trail of operator actions and replay related video.
- ff. Backup and restore system database.
- gg. Create an unlimited number of custom user roles.
- hh. Create and share lockable layouts.
- ii. Update layouts in real time.
- jj. Record their screen in full resolution and up to 30 fps.
- kk. Add a local folder to add local files for search and playback.
- ll. A Video Wall mode to control the application remotely.
- mm. A Media Player mode to use the application as a media player.
- nn. Remember past system connections and user credentials and will allow operators to quickly search for and switch between systems.
- oo. Adjust aspect ratio and streaming quality (high resolution or low resolution) of items displayed on the viewing grid.
- pp. Display I/O devices as an individual item on the viewing grid create custom names for inputs and output.
- qq. Customize the layout of I/O panels on the item in the viewing grid including indicators for inputs and buttons for outputs.
- rr. De-warp any fisheye lens using automatic calibration or manual calibration without the need for any third party SDKs.
- ss. Create fully customizable viewing tours which include any combination of live video streams, offline videos, images, websites (or URLs), I/O devices, and Server health monitoring status.

- tt. Modify and save a shared layout to affect an instantaneous change to that layout on the VMS Desktop application of any user connected to the system viewing that layout (when the system administrator saves the layout the layout will update in real time for any user viewing that layout).
 - uu. Support two-way audio between operators and supported devices.
 - vv. Support audio alerts as an action that can be played on users' computers or connected system devices.
 - ww. Support PTZ presets and tours.
 - xx. Support PTZ presets and tours in fisheye cameras using de-warp mode.
 - yy. Schedule recording for connected cameras and devices with options to force minimum and maximum storage durations.
 - zz. Configure pre and post recording for motion events.
 - aaa. Optimize camera streaming quality from connected devices automatically using low, medium, high, best quality selectors or manually in the camera.
 - bbb. Export video by selecting an area on the timeline and right clicking to export.
 - ccc. Support single video export in .avi, .mp4, or .mkv formats and will offer the option to transcode any client-side effects (image enhancement, de-warping, time stamps) as part of the exported video.
 - ddd. Support multi-video export in an executable format to create a fully portable version of the VMS Desktop application including all exported video files.
 - eee. A rapid review export feature which will allow operators to compress any length of video into a short video (e.g. export 8 hours of archives into a 30 second video clip).
 - fff. Activate or deactivate system licenses on Internet connected systems.
 - ggg. Force open an alarm layout triggered by any system or 3rd party event with one or many associated cameras or resources.
 - hhh. A hidden configurable method of increasing the amount of items allowed on the viewing grid.
 - iii. Adjust configuration of devices.
 - jjj. Force users to set the camera's initial password upon enrollment for best cyber security practices.
- D. VMS Mobile Application (if required):
- 1. Runs on the Following Operating Systems:
 - a. Google Android.
 - b. Android 4.0: Ice Cream Sandwich.
 - c. Android 4.1, 4.2, 4.3: Jelly Bean.
 - d. Android 4.4: KitKat.
 - e. Android 5.0: Lollipop.
 - f. Android 6.0: Marshmallow.
 - g. Android 7.0 7.1: Nougat.
 - h. Android 8.0 8.1: Oreo.
 - i. Apple iOS: 5, 6, 7, 8, 9, 10, and 11.
 - 2. Installation: Application to be available as a free download from Google Play or Apple iTunes stores. *No additional licensing fees shall be required for the utilization of the VMS Mobile Application.*
 - 3. Performance:
 - a. Automatically discover available Systems on a local area network (LAN).
 - b. Store past system connections and credentials and allow users to quickly search for switch between systems.
 - c. Adaptive streaming and automatically adjust stream being displayed based on network speed.
 - 4. User Capabilities:
 - a. Adjust streaming resolutions manually.
 - b. Search for cameras by name.
 - c. Fisheye de-warping of any fisheye lens without 3rd party SDK.
 - d. View live video from one system.
 - e. Log in to VMS Cloud layer to view and access systems shared with a user.
 - f. Control the display of any connected "Lite Clients" in the system.
 - g. Utilize a custom media player to render and display live thumbnails and video.
 - h. Search video using a calendar.
 - i. Search video using a flex timeline.
- E. VMS Cloud Application (if utilized for off-site capabilities):

1. Supported Browsers: Allow users to log in from any modern web browser. (Google Chrome, Mozilla Firefox, Microsoft Edge, Opera, etc) from any type of device (mobile, PC, etc.)
 2. Performance:
 - a. *An optional add-on to VMS requiring no additional licensing.*
 - b. Will first attempt a direct connection to system servers using NAT Traversal technology and be able to proxy traffic to ensure access to a system in case of ISP or routing issues.
 - c. Unlimited number of connected users and systems with no additional licensing.
 - d. Utilize secure networking technologies (OpenSSL, HTTPS) and a complex Salted MD5 hash for any stored.
 - e. Users to connect an unlimited number of systems to a single user account.
 3. User Capabilities:
 - a. System Administrators:
 - 1) Share access to a system using only an email address.
 - 2) Assign custom user roles when sharing system access.
 - b. Users: Quickly search for and connect to cloud-connected systems by name.
 - c. Operators: View live or recorded video from one camera at a time on any cloud-connected system.
 - d. Passwords.
- F. Digital Video Network Equipment
1. The digital CCTV network shall be a stand alone 1000 MB network furnished and installed by the Division 28 contractor. The owner's network may be, at the option of the owner, linked to the digital video network for accommodation of remote viewing PC's, but shall not be used as the primary means of transporting digital video.
 2. Switches shall be 12, 24 or 48 port as applicable and defined below.
 3. Each switch can operate as both a master controller and a forwarding processor.
 4. Dynamic Host Configuration Protocol (DHCP) auto configuration of multiple switches through a boot server.
 5. Dynamic Trunking Protocol (DTP) to facilitate dynamic trunk configuration across all switch ports.
 6. Protocol Independent Multicast (PIM) for IP multicast routing is supported, including PIM sparse mode (PIM-SM), PIM dense mode (PIM-DM), and PIM sparse-dense mode. The IP Services image is required.
 7. Inter-VLAN IP routing for full Layer 3 routing between 2 or more VLANs.
 8. Distance Vector Multicast Routing Protocol (DVMRP) tunneling interconnects 2 multicast-enabled networks across non-multicast networks.
 9. IEEE 802.1x allows dynamic, port-based security, providing user authentication.
 10. IEEE 802.1x with VLAN assignment allows a dynamic VLAN assignment for a specific user regardless of where the user is connected.
 11. IEEE 802.1x and port security are provided to authenticate the port and manage network access for all MAC addresses, including that of the client.
 12. Port-based ACLs for Layer 2 interfaces allow security policies to be applied on individual switch ports.
 13. VLAN trunks can be created from any port, using either standards-based 802.1Q tagging.
 14. 4000 VLAN IDs are supported.
 15. IGMP snooping provides fast client joins and leaves of multicast streams and limits bandwidth intensive video traffic to only the requestors.
 16. Shall support Uni-cast routing protocol RIP v2.
 17. Shall support Protocol Independent Multicast (PIM).
 18. 32-Gbps switching fabric.
 19. Electrical Specifications:
 - a. PoE Support: 375 watts available for 24 ports with PoE+, 195 watts available for 24 ports with PoE.
 20. Ethernet switches shall be as manufactured by Cisco or HP.
- G. Equipment Racks
1. Division 28 Contractor shall provide one (1) – 19" LCD monitor at each NVR rack location to be able to view NVR/VMC/VI server(s) display. Monitor shall be rack mounted.
 2. Division 28 Contractor shall provide combination keyboard/monitor shelf at each NVR location.

3. Division 28 Contractor shall provide a mounted KVM Switch and all required cables and power supplies when more than one NVR is installed in a rack location. KVM capacity shall support connection of all NVRs in a rack location.
 4. All CCTV equipment is to be furnished with UPS backup per the UPS specification section. This includes PoE Ethernet Switch power. All 120 VAC camera circuits shall be connected to an emergency power circuit.
 5. Top and bottom shall be 14-gauge steel, horizontal braces shall be 16-gauge steel welded to integral structural side panels of 16-gauge steel
 6. Shall be fully enclosed and provided with front door, rear door, side panels and top panel with cooling fans.
 7. Cooling fans shall be provided in a capacity to fully exhaust the heat dissipated by the equipment.
 8. Rack shall come equipped with two pairs of 11-gauge steel rackrail with tapped 10-32 mounting holes in universal EIA spacing.
 9. Contractor to provide 6 RU of blank space at the top to be enclosed using rack blank panels.
 10. There shall be no spacing between components within the rack.
 11. Equipment racks shall be Middle Atlantic Products or Lowell.
- H. Camera Poles:
1. The heavy-duty pole is for exterior applications and is designed to be weatherproof against the outdoor environmental element effects of discoloration and as well shall be designed to meet or exceed the local requirements for wind load resistance. The installer shall be responsible for checking the local codes for compliance.
 2. The poles shaft shall be round and extruded from all new 6063 alloy aluminum tubing and heat-treated to produce a T6 temper. The pole shaft shall be 6" in diameter by 18 feet tall non-tapered and shall be of one-piece seamless construction. Shafts with seams welded or not will not be acceptable.
 3. The pole shaft shall be continuously welded to a 12" base plate. The base plate shall be cast from A356 aluminum alloy and tempered to Aluminum Association T6 standards.
 4. The anchor bolts shall be fabricated from structural quality, hot rolled carbon bar, having a minimum yield strength of 50,000 PSI. The anchor bolts shall be an "L" design and shall be galvanized.
 5. An extruded handhole to provide for internal wiring shall be provided and shall have a cover with tamper resistant security screws.
 6. The unit shall be designed and manufactured to allow the conduit and wiring to be totally concealed and run within the unit.
 7. The unit shall be finished in a standard dark bronze (DB) powder coating. Other finishes are available.
 8. Concrete Mounting Base;
 9. The pole shall mount to a round concrete base. The concrete base will be furnished under the General Construction Contract.
 10. Poles shall be United Lighting Standards or approved equal.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data; including product technical bulletins, product catalog, installation instructions, submittal sketches or drawings, and product carton instructions for installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify that related conditions, including equipment that has been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
- B. All devices connected to equipment specified in this section shall bear the UL, cUL, or CSA label and comply with all applicable National Electrical Code (NEC) standards.

3.03 PREPARATION

- A. Division 28 Subcontractor shall develop custom software as required to effect the functions of the system as dictated by the drawings and Specifications.
- B. Division 28 Subcontractor shall provide equipment cabinets for installation of the control equipment and cable terminations to the equipment.
- C. All equipment related to the system shall be factory tested before shipment.

3.04 INSTALLATION

- A. Contractor shall furnish all equipment, labor, system setup, and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein.
- B. Install in accordance with manufacturer's handling and installation instructions.
- C. Install in accordance with all local and pertaining codes and regulations.
- D. All equipment and systems shall be installed by the ESC. Subcontracting of equipment installation shall not be permitted.
- E. Equipment shall be ready to use condition at end of installation.
- F. Energize equipment in accordance with manufacturer's instructions.

3.05 PROTECTION AND CLEANING

- A. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
- B. Touch up, repair, or replace damaged components before Substantial Completion.
- C. Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of equipment. Remove construction debris from equipment area and dispose of debris.
- D. Clean integral air filters, heatsinks, grills, and fans before Substantial Completion and Commissioning Services.

3.06 WARRANTY

- A. The ESC shall provide a single source warranty for all supplied equipment specified in this section to be free of defects in material and workmanship for a period of one (1) years from the date of substantial completion.

END OF SECTION 280300

SECTION 280710 - UNINTERRUPTIBLE POWER SYSTEM (UPS)

PART 1 - GENERAL

1.01 SUMMARY.

- A. Provide UPS equipment as specified herein and as shown on the schedules and drawings. Installing contractor shall receive, place, connect, and mount all equipment specified in this Section per the manufacturer's instructions. Installing contractor shall furnish all hardware, wire, connectors, and other necessary items as required for a complete and functional UPS system.
- B. Related Sections:
 - 1. Section 11190 Detention Equipment
 - 2. Section 260000 Electrical
 - 3. Section 280000 Security Electronics, General
 - 4. Section 280120 Touch Screen System
 - 5. Section 280140 Programmable Logic Controller
 - 6. Section 280200 Intercommunications System
 - 7. Section 280300 IPCCTV

1.02 REFERENCES.

- A. The General Conditions, Supplementary Conditions, and Division 1 Specifications shall apply to all work of this section.
- B. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- C. Underwriter's Laboratories (UL)
 - 1. UL 508 Industrial Control Equipment
 - 2. NEC National Electrical Code (latest edition)

1.03 WORK INCLUDED

- A. Furnish all materials and services as required to provide back up UPS power to the Division 28 systems.

1.04 APPROVALS

- A. General
 - 1. Submittals shall be made in accordance with the General Provisions (Section 280000) of these specifications.
- B. Specific Requirements:
 - 1. Submit catalog cuts for all equipment and devices being furnished under this Section.
 - 2. Load summary for each UPS panel. Load summary shall identify the actual measured loads or calculated loads for each specific load. Loads shall be based on equipment to be furnished and installed.

1.05 DESCRIPTION

- A. The primary function of the uninterruptible power system (UPS) is to ensure that critical security electronics and communications systems elements remain operational and without errors caused by power line disturbances or interruptions.
- B. All doors and gates, except vehicle gate operators, shall be powered from the UPS distribution system. This does not include power to door locks. All other Division 28 equipment shall be powered from the UPS power source. This includes but is not limited to, PLC and relay equipment, intercom equipment, CCTV equipment, including camera power, control room equipment including monitors, keypads, computers, graphic control panels and video visitation equipment.
- C. Each UPS shall be rack mounted inside the enclosed security electronics equipment rack. Unit shall be sized for the connected load, plus a 20% reserve. Batteries shall be sized for 30 minutes of run time at 100% loading.

PART 2 - PRODUCTS

2.01 MATERIALS

A. UPS System:

1. Each UPS unit shall be sized as described herein.
2. Supply voltage to the UPS shall be either 120 or 208 volt, single phase, 60 Hz. Division 28 shall provide and install dry- type transformers for 208 volt single phase supplies to create the conversion to the required 240 UPS input.
3. Division 28 shall provide over-current protection per the NEC.
4. Output voltage shall be 120V, single phase, 60Hz.
5. Units shall equipped with sealed batteries.
6. UPS systems shall be Liebert UPStation S Series, CyberPower, APC or approved equal.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- #### **A. Compliance:** Comply with manufacturer's product data; including product technical bulletins, product catalog, installation instructions, submittal sketches or drawings, and product carton instructions for installation.

3.02 EXAMINATION

- #### **A. Site Verification of Conditions:** Verify that related conditions, including equipment that has been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
- #### **B.** All devices connected to equipment specified in this section shall bear the UL, cUL, or CSA label and comply with all applicable National Electrical Code (NEC) standards.

3.03 INSTALLATION

- #### **A.** Contractor shall furnish all equipment, labor, system setup, and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein.
- #### **B.** Install in accordance with manufacturer's handling and installation instructions.
- #### **C.** Install in accordance with all local and pertaining codes and regulations.
- #### **D.** All equipment and systems shall be installed by the ESC. Subcontracting of equipment installation shall not be permitted.
- #### **E.** Equipment shall be ready to use condition at end of installation.
- #### **F.** Energize equipment in accordance with manufacturer's instructions.

3.04 PROTECTION AND CLEANING

- #### **A. Storage and Protection:** Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
- #### **B.** Touch up, repair, or replace damaged components before Substantial Completion.
- #### **C.** Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of equipment. Remove construction debris from equipment area and dispose of debris.
- #### **D.** Clean integral air filters, heatsinks, grills, and fans before Substantial Completion and Commissioning Services.

3.05 WARRANTY

- #### **A.** The ESC shall provide a single source warranty for all supplied equipment specified in this section to be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.

END OF SECTION 280710

SECTION 28 23 60 ACCESS CONTROL SYSTEMS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Provisions of the Contract and of the Contract Documents apply to this section.

1.2 SUMMARY

- A. Provide and install as shown on the Drawings and herein specified a complete and operable Access Control System. Readers shall consist of proximity readers with keypads. Upon correctly entering a personal ID code and/or presenting a proximity card, the system shall grant access to a controlled device or resource.
- B. The Access Control System (ACS) shall support a minimum of 120 proximity card readers. The ACS will be required to utilize prox readers at each cell in lieu of key switches or "Pipe" system buttons. Officers will use their prox card to register cell check tours. The system must include the ability for the owner to run user reports on each individually assigned cards as well as aggregate information for owner review.
- C. The ACS shall be installed in accordance with all applicable NEC, and local building codes. All equipment shall be UL labeled. All equipment shall be compatible.
- D. The ACS shall interface to the Fire Alarm System, as required, to meet all required Fire and Life Safety Codes.
- E. The system shall include, but not be limited to, the following
1. Proximity card & keypad combo readers
 2. Control Processors
 3. Alarm monitoring modules
 4. Output relay modules
 5. Access control proximity cards
 6. PC running the Card Access System's Software and Badging Software
 7. I.D. Photo Access Cards with identification images and logos
 8. Remote release of doors, as indicated on the Drawings
 9. Installation and provision of all required system and card reader cabling.
- F. The Access Control System shall log all access control events, including access granted, access denied and duress codes used. All access control events shall be associated with the token user's Name.
- G. The Access Control System's database shall be capable of a minimum of 500 user accounts, and capable of supporting 3 client licenses.
- H. The ACS shall be a robust, user-friendly, easily expandable solution. Users shall be added, modified, and deactivated using a Windows-based GUI interface. Each user shall be given customized access rights to controlled devices and other resources based on the time of day, day of the week, and restricted dates. In addition, users must be able to be assigned to customized user groups, which system administrators shall be able to create in order to streamline the access management process and tailor it to their own needs.
- I. Users shall be capable of entering Duress Codes at proximity reader/keypads, which shall activate a duress alarm at that location on one or more VGUI's. Login to the Access Control software shall be password protected and access shall be logged to the ACS.
- J. The access system must be independent of the PLC Electronic Security System.
- K. The system shall have a fully integrated, Windows-based help system.

1.3 SOFTWARE FEATURES

- A. Provide the following software features for the Access Control System. Provide user input, screen

types, and selection methods, as follows, or in a similar manner to meet the intent the specified configuration capabilities and parameters.

- B. User Configuration Functions: A user shall include any individual that uses the access control system to access resources, such as a door, software application, or ACS workstation(s). A user shall also include an administrator who is using the access client software to add users and set permissions and rules. User configuration functions shall include the following:
1. Creating a New User
 - a. Provide a User Configuration screen that shall allow the operator to create a new user or display information about current users. The information fields displayed shall include the following; Last Name, First Name, Middle Name and ID Number. The ID Number shall be any combination of letters and numbers up to a maximum of 50 characters.
 - b. Any custom user information shall be capable of being entered into the Additional Information tab.
 - c. An image shall be capable of being associated with a user and stored in the ACS database for retrieval from the client software.
 2. Modifying a User (Searching)
 - a. Provide a means to modify information about existing users.
 - b. Provide a User Search dialog box that, by default, displays all active users in the database. The User Configuration screen for each user shall be displayed upon the selection of a user in the database.
 - c. Provide a means to facilitate a more refined search. The operator shall be capable of selecting a field (i.e. – Last Name, First Name, ID Number, token, etc.) to search on in a “Search” list and typing the desired text in a “For” box. The operator shall also be capable of searching for deactivated accounts.
 3. Acquiring an Image for a User
 - a. Provide a means to capture an image and associate it with an individual user in the database.
 - b. Provide an Image Acquire screen that shall allow an operator to capture an image via an image capture device (i.e. – USB camera). Provide a drop-down list of available image capture devices.
 - c. Provide a preview window that displays a live video stream. Depending upon the options available for the selected image capture device, provide Format, Source, Compression, and Display buttons to allow the operator to fine-tune the video stream.
 - d. Provide an Image Capture button for the operator to select once the user is positioned properly in the preview window. Once selected, the image shall appear in a separate user image window. Provide a means to assign the captured image to the user.
 4. Importing an Image for a User
 - a. Provide a means to import an image and associate it with an individual user in the database.

- b. Provide an Import Image screen that shall allow an operator to import an existing image. Provide a window for the operator to browse to an existing image and open the image once it is found.
 - c. Provide an outlined area (or box) showing the size of the user image window. If the imported image is larger than the user image window, the operator shall be able to relocate the image box by holding down the left mouse button and dragging the box to the desired location within the image. Provide a means to assign the imported image to the user.
- 5. Assigning Permissions to a User
 - a. Provide a means to allow users access to system resources.
 - b. Provide an Assign Permissions tab within the User Configuration screen. This screen shall show a list of all system resources. Each resource shall include a checkbox to allow access to that particular resource. Provide a “filter” box with drop down menu to allow the operator to select and display a particular type of resource. Resource types shall include, but not be limited to, the following; Doors, Access Control System software, etc.
- 6. Assigning a User to User Groups
 - a. Provide a means to allow users to be assigned to User Groups. A User Group shall be defined as a specific group of users who share the same permissions and rules. When a user is assigned to a group, they shall receive the same permissions and rules that the group has, in addition to their own individual permissions and rules. Users shall be capable of belonging to more than one user group.
 - b. Provide an Assign Groups tab within the User Configuration screen. This screen shall show a list of all user groups in the system. Each group shall include a checkbox to assign the user to that particular group, or a similar means of selection.
- 7. Assigning Rules to a User
 - a. Provide a means to assign rules to a user. Assigning rules to a user shall allow the user’s permissions to be restricted to specific days of the week, as well as specific times of the day. Provide a means to have a user’s access to activate or expire on a specific day or prevent them from using permissions on restricted dates
 - b. Provide an Assign Rules tab within the User Configuration screen. Provide an ‘Allow access only on selected days of the week’ checkbox for users that are allowed access only on specific day(s). Provide checkboxes for each day of the week for the operator to select for days they want the user to have access on.
 - c. Provide an ‘Allow access only during time range’ checkbox for users that are allowed access only during specific times. Provide time configuration boxes for ‘No earlier than’ and ‘No later than’ that include the time in hours, minutes and seconds. Provide indications for “AM” and “PM”.
 - d. Provide an ‘Unrestricted Access’ checkbox to select for users that have no access restrictions based on the time of the day and the day of the week.
 - e. Provide an ‘Access has activation date’ checkbox for users that have permissions that should not begin until a later date. Provide a drop-down calendar tool to set the activation date.
 - f. Provide an ‘Access has expiration date’ checkbox for users that have permissions that should expire on a certain date. Provide a drop-down calendar tool to set the expiration date.
 - g. Provide an ‘Allow access on restricted dates’ checkbox for users that are allowed access on restricted dates.
- 8. Assigning Tokens to a User

- a. Provide a means to assign tokens to a user. Assigning Tokens to a user consists of assigning items such as a PIN code, Duress Code, proximity card number, password, etc. that the Access Control System uses to identify a user.
 - b. Provide an Assign Tokens tab within the User Configuration screen. All tokens assigned to a particular user shall be displayed on this tab.
 - c. Provide information fields for the following tokens: Proximity Card, Personal Identification Number, Duress Code and User Name and Password.
 - d. Provide a Proximity Card field that shall be used to assign a proximity card ID number to the user. For this feature, a proximity reader enrollment station may be used. The operator shall activate an Enroll button and swipe a proximity card at the enrollment reader. The proximity ID will appear in the field when the card is read.
 - e. Provide a Personal Identification Number field that shall be used to assign a unique number to a user for use with proximity readers with a keypad option. Upon correct entry of a personal identification number at a keypad, the user shall be granted access to the resource. The personal identification number shall be up to a maximum of 12 digits long, and unique for all users.
 - f. Provide a Duress Code field that shall be used to assign a unique number to a user for use with proximity readers with a keypad option. Upon correct entry of a duress code at a keypad, the ACS workstation shall be notified that a duress alarm exists. The duress code shall be a maximum of 5 digits long.
 - g. Provide User Name and Password fields that shall be used to assign a unique user name and corresponding password for the purpose of accessing access control system client software.
9. Creating a New User Group
 - a. Provide a means to create User Groups, which shall allow the operator to easily assign the same permissions and rules to many users.
 - b. Provide a Group Configuration screen that shall allow the operator to create a new group or display information about current groups. The information fields displayed shall include the following; Group Name.
10. Modifying a User Group (Searching)
 - a. Provide a means to modify information about existing user groups.
 - b. Provide a User Group Search dialog box that, by default, displays all active user groups in the database. The User Group Configuration screen for each user group shall be displayed upon the selection of a user group in the database.
 - c. Provide a means to facilitate a more refined search. The operator shall be capable of selecting a field (i.e. – Group Name, Resource Type, Resource Name) to search on in a “Search” list and typing the desired text in a “For” box
11. Assigning Permissions to a User Group
 - a. Provide a means to allow user groups access to system resources
 - b. Provide an Assign Permissions tab within the User Group Configuration screen. This screen shall show a list of all system resources. Each resource shall include a checkbox to allow access to that particular resource. Provide a “filter” box with drop down menu to allow the operator to select and display a particular type of resource.
 - c. Provide “Check All” and “Uncheck All” buttons for the operator to select to simplify the assignment of permissions.
12. Assigning Rules to a User Group
 - a. Provide a means to assign rules to user groups. Assigning rules to a user group shall allow the user group’s permissions to be restricted to specific days of the

- week, as well as specific times of the day. Provide a means to have a user group's access to activate or expire on a specific day or prevent the group from using permissions on restricted dates.
- b. Provide an Assign Rules tab within the User Group Configuration screen. Provide an 'Allow access only on selected days of the week' checkbox for user groups that are allowed access only on specific day(s). Provide checkboxes for each day of the week for the operator to select for days they want the user group to have access on.
 - c. Provide an 'Allow access only during time range' checkbox for user groups that are allowed access only during specific times. Provide time configuration boxes for 'No earlier than' and 'No later than' that include the time in hours, minutes and seconds. Provide indications for "AM" and "PM".
 - d. Provide an 'Unrestricted Access' checkbox to select for user groups that have no access restrictions based on the time of the day and the day of the week
 - e. Provide an 'Access has activation date' checkbox for user groups that have permissions that should not begin until a later date. Provide a drop-down calendar tool to set the activation date.
 - f. Provide an 'Access has expiration date' checkbox for user groups that have permissions that should expire on a certain date. Provide a drop-down calendar tool to set the expiration date.
 - g. Provide an 'Allow access on restricted dates' checkbox for user groups that are allowed access on restricted dates.
13. Assigning Users to a User Group
- a. Provide a means to assign users to user groups. When a user is assigned to a user group, they receive the permissions and rules of the user group in addition to their own rules and permissions.
 - b. Provide an Assign Users tab within the User Group Configuration screen. Each user in the database shall be displayed. Each user shall include a checkbox to assign the user to that particular group.
- C. Administrative Configuration Functions: Provide administrative-level tools to enhance and customize the functionality of the access control system software.
1. Adding/Modifying/Deleting User Information Types
 - a. Provide a User Information Type screen that shall allow the administrator to create new, modify existing, or delete existing information fields for users. Information types (i.e. – address, phone number, etc.) shall be defined by the administrator on this screen. The administrator shall be capable of assigning a display order for each information field. A minimum of 500 administrator- definable user information types shall be available.
 - b. Once defined, these fields shall be displayed in the User Configuration screen. Provide an Additional Information tab within the User Configuration screen. All additional information specific to a particular user shall be displayed on this tab.
 2. Adding/Modifying/Deleting Restricted Dates
 - a. Provide a Restricted Dates screen that shall allow the administrator to create new, modify existing, or delete existing restricted dates. Restricted Dates shall be used to control access on Holidays or other user-defined dates. Restricted dates shall be defined by the administrator on this screen. The administrator shall be capable of assigning a name, as well as a date for the restricted date on this screen. A minimum of 500 administrator- definable restricted dates shall be available.
 - b. Once defined, access on restricted dates shall granted by going to the Assign Rules tab within the User Configuration screen, and checking the 'Allow access on restricted dates' checkbox.

3. Reporting Features: The access system shall have the following reporting features
 - a. User Profile Report: This report shall provide information in a document format on the user, such as full name, ID Number, and whether the account is activated or deactivated. This report shall also detail what group(s) the user belongs to, as well as what resources the user has permission to access. The rules for the user shall also be listed in the User Profile Report.
 - b. Resource Report: This report shall provide information in a document format on a particular resource. This report shall detail the specific resource chosen, as well as what group and user permissions are assigned to the resource.
4. System Backup/Restore: The access system shall have the following administration features
 - a. Database Backup: This tool shall provide a database management window, which shall allow the database files to be backed up to another directory or external media.
 - b. Database Restore: This tool shall provide a database management window, which shall allow the database files to be restored from another directory or external media
5. Badge Designer: The system shall have the following Badge Designer features
 - a. Badge Designer Basics: This tool shall be used to create custom badge templates. A badge template can then be assigned to any number of users in order to print custom user badges. The badge designer shall be capable of creating templates for use with badges with similar requirements.
 - b. Badge Printing: This tool shall be used to allow for edge-to-edge card printing.

1.4 SUBMITTALS

- A. Refer to Section 282300 for submittal requirements.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. I-PRO.
- B. Hirsch Electronics
- C. Lenel Systems International,
- D. ICT

2.2 MATERIALS

- A. All components used in creating the access control system shall be of the same manufacturer and/or approved by the manufacturer for system compatibility. Equipment and specified herein is for the purpose of establishing the types of equipment and the minimum quality of equipment required. It shall be the ESSC's responsibility to assure the compatibility of all access control equipment, software, programming, cable, mounting methods, etc. that are used in providing a complete system.

- B. The access control computer shall include both the access control application and badging software application, with associated databases, and be configured as follows:
1. PC-based workstation with an Intel Core i5-4570 quad core, 3.2GHz turbo processor or better. Configured with 512K cache, 8GB 1600MHz DD3 Memory, 250GB hard drive, 2 USB ports, network card for Ethernet operation, CD-ROM drive, sound card, video accelerator, running Windows 10 pro. Include a 1200DPI Laser jet printer and UPS.
 2. Approved Manufacturers:
 - a. HP
 - b. Dell
 3. Provide access control computer with a 22" LCD flat panel touch screen with 1920 X 1080 pixel resolution.
 - a. Approved Manufacturers – Dell, Samsung, NEC
 4. Badging Equipment: Provide CCTV enrollment camera and badge printer.
 5. Locate equipment in Server/Phone Room A140.
- C. Proximity Reader/Keypad
1. Dimensions: 5.0" x 5.0" x 1.0"
 2. Material: Polycarbonate UL 94
 3. Power Supply: 10-28.5 VDC
 4. Current Requirements: Average – 100mA (12VDC), Peak – 120mA (24VDC)
 5. Operating Temperature: -22° to 150°F (-30° to 65°C)
 6. Operating humidity: 0-95% relative humidity, non-condensing
 7. Transmit and Excite Frequency: 125kHz
 8. The unit shall include an integrated weatherized keypad.
 9. The proximity reader/keypad shall be a HID Corp. ProxPro model 5355 with keypad
- D. Proximity Reader Enrollment Station
1. Read Range: 1"-3" dependent upon proximity card type and environmental conditions
 2. Dimensions: 3 3/8" x 2" x 0.6"
 3. Power Supply: USB self-powered
 4. Certifications: FCC Certification, CE Mark
 5. When a proximity card or key fob is presented to the reader, the red LED flashed green.
 6. Provide one proximity reader enrollment station per PC (with access control system software installed) that is designated as an enrollment station.
- E. Printable Proximity Access Card
1. Dimensions: 2.125" x 3.375" x 0.033"
 2. Construction: Thin, flexible polyvinyl chloride (PVC) laminate
 3. Operating Temperature: -50° to 160°F (-45° to 70°C)
 4. Read range: up to 7"
 5. Format: Shall support formats up to 85 bits.
 6. Options: Card shall include external card numbering, vertical slot punch and artwork gloss finish.
 7. The proximity access card shall be a HID model 1386-LGSMV.
 8. Provide 200 cards to the Owner upon final completion.

- F. Additional Card Access System Equipment:
 - 1. Provide the system with the following additional accessories:
 - a. Two (2) Card/Keypad Readers.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Check location, “roughing in”, and field dimensions prior to beginning work.
- B. Do not begin installation until all unsatisfactory conditions have been corrected.
- C. Verify field measurements are as shown on Drawings and as instructed by manufacturer
- D. Verify that required utilities are available, in proper location, and ready for use.
- E. Execute pre-approved test plan to demonstrate system is fully operational.

3.2 INSTALLATION/APPLICATION OF ALL SECURITY PRODUCTS:

- A. Field testing and inspection will be performed under the provisions of Section 282300.
- B. Install and configure all software required to provide a fully functional Access Control system as specified.
- C. Install Access Control Computer and Badging components. Coordinate workstation placement with Owner.
- D. Install Access Control Panel(s) and associated equipment rooms. Coordinate location with Owner and Division 27 Contractor.
- E. Install all card readers adjacent to latch, on non-secure side of each door. Mount card readers at 48” AFF (to top of card reader).
- F. Provide and install all required cabling in conduit. Coordinate conduit provisioning and installation with Electrical Contractor.

END OF SECTION 28 23 60

DIVISION 22: PLUMBING

22 0000 PLUMBING

- 22 0501 COMMON PLUMBING REQUIREMENTS
- 22 0529 HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
- 22 0553 IDENTIFICATION FOR PLUMBING PIPES AND EQUIPMENT
- 22 0716 PLUMBING PIPING INSULATION

22 1000 PLUMBING PIPES AND PUMPS

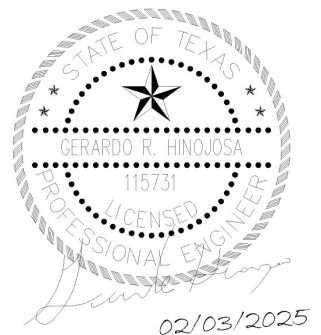
- 22 1116 DOMESTIC WATER PIPING
- 22 1119 DOMESTIC WATER PIPING SPECIALTIES
- 22 1316 FACILITY SANITARY SEWERS
- 22 1319 FACILITY SANITARY SEWER SPECIALTIES

22 3000 PLUMBING EQUIPMENT

22 4000 PLUMBING FIXTURES

- 22 4216 COMMERCIAL LAVATORIES AND SINKS

END OF TABLE OF CONTENTS



SECTION 22 05 01**COMMON PLUMBING REQUIREMENTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Common requirements and procedures for plumbing systems.
 - 2. Responsibility for proper operation of electrically powered equipment furnished under this Division.
 - 3. Furnish and install sealants relating to installation of systems installed under this Division.
 - 4. Furnish and install Firestop Penetration Systems for plumbing systems penetrations as described in Contract Documents.
- B. Products Furnished But Not Installed Under This Section:
 - 1. Sleeves, inserts, supports, and equipment for plumbing systems installed under other Sections.
- C. Related Requirements:
 - 1. Section 03 30 53: Exterior concrete pads and bases for mechanical equipment.
 - 2. Section 05 05 23: Quality and requirements for welding.
 - 3. Section 07 84 00: Quality of Penetration Firestop Systems to be used on Project and submittal requirements.
 - 4. Section 07 92 13: Quality of sealants used at building exterior.
 - 5. Sections Under 09 90 00 Heading: Painting of plumbing items requiring field painting.
 - 6. Section 13 48 00: Sound, Vibration, And Seismic Control.
 - 7. Division 26: Raceway and conduit, unless specified otherwise, and line voltage wiring.
 - 8. Slots and openings through floors, walls, ceilings, and roofs provided under other Divisions in their respective materials.
 - 9. Division 33: Piped utilities.

1.2 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Manufacturer's catalog data for each manufactured item.
 - 1) Provide section in submittal for each type of item of equipment. Include Manufacturer's catalog data of each manufactured item and enough information to show compliance with Contract Document requirements. Literature shall show capacities and size of equipment used and be marked indicating each specific item with applicable data underlined.
 - 2) Include name, address, and phone number of each supplier.
- B. Closeout Submittals:
 - 1. Operation And Maintenance Manual Data:
 - a. Modify and add to requirements of Section 01 7800 as follows:
 - 1) At beginning of PLUMBING section of Operations And Maintenance Manual, provide master index showing items included.
 - 2) Provide name, address, and phone number of Architect, Architect's Mechanical Engineer, General Contractor, and Plumbing subcontractor.
 - 3) Provide operating instructions to include:
 - a) General description of each plumbing system.
 - b) Step by step procedure to follow in putting each piece of plumbing equipment into operation.

- 4) Identify maintenance instructions by using same equipment identification used in Contract Drawings. Maintenance instructions shall include:
 - a) List of plumbing equipment used indicating name, model, serial number, and nameplate data of each item together with number and name associated with each system item.
 - b) Manufacturer's maintenance instructions for each piece of plumbing equipment installed in Project. Instructions shall include name of vendor, installation instructions, parts numbers and lists, operation instructions of equipment, and maintenance instructions.
- 5) Include copies of warranties required in individual Sections of Division 22.

1.3 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 1. Perform work in accordance with applicable provisions of Plumbing Codes applicable to Project. Provide materials and labor necessary to comply with rules, regulations, and ordinances.
 2. In case of differences between building codes, laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Notify Architect in writing of such differences before performing work affected by such differences.
- B. Identification:
 1. Motor and equipment name plates as well as applicable UL / ULC and AGA / CGA labels shall be in place when Project is turned over to Owner.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- D. Storage:
 1. In addition to requirements specified in Division 01, stored material shall be readily accessible for inspection by Architect until installed.
 2. Store items subject to moisture damage in dry, heated spaces.

1.5 WARRANTY

- A. Guarantee plumbing systems to be free from noise in operation that may develop from failure to construct system in accordance with Contract Documents.
- B. Provide certificates of warranty for each piece of equipment made out in favor of Owner.
- C. If plumbing sub-contractor with offices located more than 150 miles 240 km from Project site is used, provide service / warranty work agreement for warranty period with local plumbing sub-contractor approved by Architect. Include copy of service / warranty agreement in warranty section of Operation And Maintenance Manual.

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Pipe And Pipe Fittings: Weld-O-Let and Screw-O-Let fittings are acceptable. Use domestic made pipe and pipe fittings on Project, except non-domestic made cast iron pipe and fittings by MATCO-NORCA are acceptable.
- B. Sleeves:
 - 1. In Framing And Suspended Floor Slabs: Standard weight galvanized iron pipe, Schedule 40 PVC, or 14 ga 2 mm galvanized sheet metal two sizes larger than bare pipe or insulation on insulated pipe.
 - 2. In Concrete And Masonry: Sleeves through outside walls, interior shear walls, and footings shall be schedule 80 black steel pipe with welded plate.
- C. Valves: Valves of same type shall be of same manufacturer.
- D. Components shall bear Manufacturer's name and trade name. Equipment and materials of same general type shall be of same make throughout work to provide uniform appearance, operation, and maintenance.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Drawings:
 - 1. Plumbing Drawings show general arrangement of piping, equipment, etc. Follow as closely as actual building construction and work of other trades will permit.
 - 2. Consider Architectural and Structural Drawings part of this work insofar as these drawings furnish information relating to design and construction of building. These drawings take precedence over Plumbing Drawings.
 - 3. Because of small scale of Drawings, it is not possible to indicate all offsets, fittings, and accessories that may be required. Investigate structural and finish conditions affecting this work and arrange work accordingly, providing such fittings, valves, and accessories required to meet conditions.
- B. Verification of Conditions:
 - 1. Examine premises to understand conditions that may affect performance of work of this Division before submitting proposals for this work. Examine adjoining work on which plumbing work is dependent for efficiency and report work that requires correction.
 - 2. Ensure that items to be furnished fit space available. Make necessary field measurements to ascertain space requirements including those for connections and furnish and install equipment of size and shape so final installation shall suit true intent and meaning of Contract Documents. If approval is received by Addendum or Change Order to use other than originally specified items, be responsible for specified capacities and for ensuring that items to be furnished will fit space available.
 - 3. Check that slots and openings provided under other Divisions through floors, walls, ceilings, and roofs are properly located. Perform cutting and patching caused by neglecting to coordinate with Divisions providing slots and openings at no additional cost to Owner.
 - 4. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions.

3.2 PREPARATION

- A. Changes Due To Equipment Selection:
 - 1. Where equipment specified or otherwise approved requires different arrangement or connections from that shown in Contract Documents, submit drawings showing proposed installations.
 - 2. If proposed changes are approved, install equipment to operate properly and in harmony with intent of Contract Documents. Make incidental changes in piping, ductwork, supports, installation, wiring, heaters, panelboards, and as otherwise necessary.
 - 3. Provide additional motors, valves, controllers, fittings, and other equipment required for proper operation of systems resulting from selection of equipment.
 - 4. Be responsible for proper location of rough-in and connections provided under other Divisions.

3.3 INSTALLATION

- A. Interface With Other Work:
 - 1. Furnish exact location of electrical connections and complete information on motor controls to installer of electrical system.
 - 2. Furnish sleeves, inserts, supports, and equipment that are to be installed by others in sufficient time to be incorporated into construction as work proceeds. Locate these items and confirm that they are properly installed.
 - 3. Furnish inserts for attaching hangers that are to be cast in concrete floor construction to Division 03 at time floors are poured.
- B. Cut carefully to minimize necessity for repairs to previously installed or existing work. Do not cut beams, columns, or trusses.
- C. Locating Equipment:
 - 1. Arrange pipes and equipment to permit ready access to valves, cocks, unions, traps, and to clear openings of doors and access panels.
 - 2. Adjust locations of pipes, equipment, and fixtures to accommodate work to interferences anticipated and encountered.
 - 3. Install plumbing work to permit removal of equipment and parts of equipment requiring periodic replacement or maintenance without damage to or interference with other parts of equipment or structure.
 - 4. Determine exact route and location of each pipe before fabrication.
 - a. Right-Of-Way:
 - 1) Lines that pitch shall have right-of-way over those that do not pitch. For example, plumbing drains shall normally have right-of-way.
 - 2) Lines whose elevations cannot be changed shall have right-of-way over lines whose elevations can be changed.
 - b. Offsets, Transitions, and Changes in Direction:
 - 1) Make offsets, transitions, and changes in direction in pipes as required to maintain proper head room and pitch of sloping lines whether or not indicated on Drawings.
 - 2) Furnish and install all traps, air vents, sanitary vents, and devices as required to effect these offsets, transitions, and changes in direction.
- D. Penetration Firestops: Install Penetration Firestop System appropriate for penetration at plumbing systems penetrations through walls, ceilings, roofs, and top plates of walls.
- E. Sealants:
 - 1. Seal openings through building exterior caused by penetrations of elements of plumbing systems.
 - 2. Furnish and install acoustical sealant to seal penetrations through acoustically insulated walls and ceilings.
- F. Furnish and install complete system of piping, valved as indicated or as necessary to completely control entire apparatus.

1. Pipe drawings are diagrammatic and indicate general location and connections. Piping may have to be offset, lowered, or raised as required or directed at site. This does not relieve this Division from responsibility for proper installation of plumbing systems.
 2. Arrange piping to not interfere with removal of other equipment, ducts, or devices, or block access to doors, windows, or access openings.
 - a. Arrange so as to facilitate removal of tube bundles.
 - b. Provide accessible flanges or ground joint unions, as applicable for type of piping specified, at connections to equipment and on bypasses.
 - 1) Make connections of dissimilar metals with di-electric unions.
 - 2) Install valves and unions ahead of traps and strainers. Provide unions on both sides of traps.
 - c. Do not use reducing bushings, bull head tees, close nipples, or running couplings. Street elbows are allowed only on potable water pipe **3/4 inch 19 mm** in diameter and smaller.
 - d. Install piping systems so they may be easily drained
 - e. Install piping to insure noiseless circulation.
 - f. Place valves and specialties to permit easy operation and access. Valves shall be regulated, packed, and glands adjusted at completion of work before final acceptance.
 3. Do not install piping in shear walls.
 4. Cut piping accurately to measurements established at site. Remove burr and cutting slag from pipes.
 5. Work piping into place without springing or forcing. Make piping connections to pumps and other equipment without strain at piping connection. Remove bolts in flanged connections or disconnect piping to demonstrate that piping has been so connected, if requested.
 6. Make changes in direction with proper fittings.
 7. Expansion of Thermoplastic Pipe:
 - a. Provide for expansion in every **30 feet 9 meters** of straight run.
 - b. Provide **12 inch 300 mm** offset below roof line in each vent line penetrating roof.
 8. Expansion of PEX Pipe: Allow for expansion and contraction of PEX pipe as recommended by Pipe Manufacturer.
- G. Sleeves:
1. Do not place sleeves around soil, waste, vent, or roof drain lines passing through concrete slabs on grade.
 2. Provide sleeves around pipes passing through concrete or masonry floors, walls, partitions, or structural members. Seal sleeves with specified sealants. Follow Pipe Manufacturer's recommendations for PEX pipe penetrations through studs and floor slabs.
 3. Sleeves through floors shall extend **1/4 inch 6 mm** above floor finish in mechanical equipment rooms above basement floor. In other rooms, sleeves shall be flush with floor.
 4. Sleeves through floors and foundation walls shall be watertight.
- H. Escutcheons:
1. Provide spring clamp plates where pipes run through walls, floors, or ceilings and are exposed in finished locations of building. Plates shall be chrome plated heavy brass of plain pattern and shall be set tight on pipe and to building surface.

3.4 REPAIR / RESTORATION

- A. Each Section of this Division shall bear expense of cutting, patching, repairing, and replacing of work of other Sections required because of its fault, error, tardiness, or because of damage done by it.
1. Patch and repair walls, floors, ceilings, and roofs with materials of same quality and appearance as adjacent surfaces unless otherwise shown.
 2. Surface finishes shall exactly match existing finishes of same materials.

3.5 FIELD QUALITY CONTROL

- A. Field Tests:
1. Perform tests on plumbing piping systems. Furnish devices required for testing purposes.

2. Replace material or workmanship proven defective with sound material at no additional cost to Owner. Repeat tests on new material, if requested.

3.6 CLEANING

- A. Remove dirt, grease, and other foreign matter from each length of piping before installation.
 1. After each section of piping used for movement of water or steam is installed, flush with clean water, except where specified otherwise.
 2. Arrange temporary flushing connections for each section of piping and arrange for flushing total piping system.
 3. Provide temporary cross connections and water supply for flushing and drainage and remove after completion of work.
- B. Clean exposed piping, equipment, and fixtures. Remove stickers from fixtures and adjust flush valves.

3.7 CLOSEOUT ACTIVITIES

- A. Instruction of Owner: Instruct building maintenance personnel and Stake Physical Facilities Representative in operation and maintenance of plumbing systems utilizing Operation And Maintenance Manual when so doing. Conduct instruction period after Substantial Completion inspection when systems are properly working and before final payment is made.

3.8 PROTECTION

- A. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system. Cap or plug open ends of pipes and equipment to keep dirt and other foreign materials out of system. Do not use plugs of rags, wool, cotton waste, or similar materials.

END OF SECTION

SECTION 22 05 29**HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Common hanger and support requirements and procedures for plumbing systems.
- B. Related Requirements:
 - 1. Section 05 05 23: Quality and requirements for welding.
 - 2. Section 07 84 00: Quality of Penetration Firestop Systems to be used on Project and submittal requirements.
 - 3. Sections Under 09 90 00 Heading: Painting of mechanical items requiring field painting.
 - 4. Slots and openings through floors, walls, ceilings, and roofs provided under other Divisions in their respective materials.

1.2 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Manufacturer's catalog data for each manufactured item.

PART 2 - PRODUCTS**2.1 ASSEMBLIES**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Anvil International, Portsmouth, NH www.anvilintl.com.
 - b. Cooper B-Line, Highland, IL www.b-line.com.
 - c. Unistrut, Wayne, MI www.tyco-unistrut.com.
- B. Materials:
 - 1. Hangers, Rods, And Inserts
 - a. Galvanized and UL approved for service intended.
 - b. Support horizontal piping from hangers or on roller assemblies with channel supports, except where trapeze type hangers are explicitly shown on Drawings. Hangers shall have double nuts.
 - 1) Support insulated pipes **2 inches 50 mm** in diameter and smaller with adjustable swivel ring hanger with insulation protection shield. Gauge and length of shield shall be in accordance with Anvil design data.
 - a) Type Two Acceptable Products:
 - (1) Swivel Ring Hanger: Anvil Fig. 69.
 - (2) Insulation Protection Shield: Anvil Fig. 167.
 - (3) Equals by Cooper B-Line.
 - 2) Support insulated pipes **2-1/2 inches 63 mm** in diameter and larger with clevis hanger or roller assembly with an insulation protection shield. Gauge and length of shield shall be according to Anvil design data.
 - a) Type Two Acceptable Products:
 - (1) Clevis Hanger: Anvil Fig. 260.
 - (2) Roller Assembly: Anvil Fig. 171.

- (3) Insulation Protection Shield: Anvil Fig. 167.
- (4) Equals by Cooper B-Line.
- 3) Support uninsulated copper pipe **2 inches 50 mm** in diameter and smaller from swivel ring hanger, copper plated and otherwise fully suitable for use with copper tubing. Support non-copper uninsulated pipes from swivel ring hanger.
- a) Type Two Acceptable Products:
- (1) Swivel Ring Hanger For Copper Pipe: Anvil Fig. CT-69.
- (2) Swivel Ring Hanger For Other Pipe: Anvil Fig. 69.
- (3) Equals by Cooper B-Line.
- 4) Support uninsulated copper pipe **2-1/2 inches 63 mm** in diameter and larger from clevis hanger, copper plated hangers and otherwise fully suitable for use with copper tubing. Support non-copper uninsulated pipes from clevis hanger.
- a) Type Two Acceptable Products:
- (1) Clevis Hanger For Copper Pipe: Anvil Fig. CT-65.
- (2) Clevis Hanger For Other Pipe: Anvil Fig. 260.
- (3) Equals by Cooper B-Line.
- c. Support rods for single pipe shall be in accordance with following table:
- | Rod Diameter | Pipe Size | Rod Diameter | Pipe Size |
|--------------|-----------------------|--------------|-------------------|
| 3/8 inch | 2 inches and smaller | 10 mm | 50 mm and smaller |
| 1/2 inch | 2-1/2 to 3-1/2 inches | 13 mm | 63 mm to 88 mm |
| 5/8 inch | 4 to 5 inches | 16 mm | 100 mm to 125 mm |
| 3/4 inch | 6 inches | 19 mm | 150 mm |
| 7/8 inch | 8 to 12 inches | 22 mm | 200 mm to 300 mm |
- d. Support rods for multiple pipe supported on steel angle trapeze hangers shall be in accordance with following table:
- | Rods | | Number of Pipes per Hanger for Each Pipe Size | | | | | | |
|--------|----------|---|----------|--------|--------|--------|--------|--------|
| Number | Diameter | 2 Inch | 2.5 Inch | 3 Inch | 4 Inch | 5 Inch | 6 Inch | 8 Inch |
| 2 | 3/8 Inch | Two | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 1/2 Inch | Three | Three | Two | 0 | 0 | 0 | 0 |
| 2 | 5/8 Inch | Six | Four | Three | Two | 0 | 0 | 0 |
| 2 | 5/8 Inch | Nine | Seven | Five | Three | Two | Two | 0 |
| 2 | 5/8 Inch | Twelve | Nine | Seven | Five | Three | Two | Two |
-
- | Rods | | Number of Pipes per Hanger for Each Pipe Size | | | | | | |
|--------|----------|---|-------|-------|-------|-------|-------|-------|
| Number | Diameter | 50mm | 63mm | 75mm | 100mm | 125mm | 150mm | 200mm |
| 2 | 10 mm | Two | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 13 mm | Three | Three | Two | 0 | 0 | 0 | 0 |
| 2 | 16 mm | Six | Four | Three | Two | 0 | 0 | 0 |
| 2 | 19 mm | Nine | Seven | Five | Three | Two | Two | 0 |
| 2 | 22 mm | Twelve | Nine | Seven | Five | Three | Two | Two |
- 1) Size trapeze angles so bending stress is less than **10,000 psi 69 Mpa**.
- e. Riser Clamps For Vertical Piping:
- 1) Type Two Acceptable Products:
- a) Anvil Fig. 261.
- b) Equals by Cooper B-Line.
- f. Concrete Inserts:
- 1) Individual Inserts:
- a) Suitable for special nuts size 3/8 inch through 7/8 inch with yoke to receive concrete reinforcing rods, and with malleable iron lugs for attaching to forms.
- b) Type Two Acceptable Products:
- (1) Anvil Fig. 282.
- (2) Equals by Cooper B-Line.
- 2) Continuous Inserts:
- a) Class Two Quality Standard: Equal to Unistrut P-3200 series.
- g. Steel Deck Bracket:
- 1) Class Two Quality Standard: Equal to Unistrut P1000 with clamp nut, minimum 6 inch length.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Interface With Other Work:
 - 1. Furnish inserts for attaching hangers that are to be cast in concrete floor construction to Division 03 at time floors are poured.
- B. Piping:
 - 1. Properly support piping and make adequate provisions for expansion, contraction, slope, and anchorage.
 - a. Except for underground pipe, suspend piping from roof trusses or clamp to vertical walls using Unistrut and clamps. Do not hang pipe from other pipe, equipment, or ductwork. Laying of piping on any building element is not allowed.
 - b. Supports For Horizontal Piping:
 - 1) Support metal piping at **96 inches 2 400 mm** on center maximum for pipe **1-1/4 inches 31 mm** or larger and **72 inches 1 800 mm** on center maximum for pipe **1-1/8 inch 28 mm** or less.
 - 2) Support thermoplastic pipe at **48 inches 1 200 mm** on center maximum.
 - 3) Support PEX pipe at 32 inches minimum on center.
 - 4) Provide support at each elbow. Install additional support as required.
 - c. Supports for Vertical Piping:
 - 1) Place riser clamps at each floor or ceiling level.
 - 2) Securely support clamps by structural members, which in turn are supported directly from building structure.
 - 3) Provide clamps as necessary to brace pipe to wall.
 - d. Install supports from inserts cast into concrete floor system, including concrete joists and floor slabs. Where inserts cannot be used, provide expansion shields and support hangers from angles held in place by expansion bolts, never directly from expansion bolt itself. Provide calculations necessary to determine number of expansion bolts required to equal capacity of cast-in-place insert.
 - e. Attach Unistrut to structural steel roof supporting structure. Spacing and support as described above.
 - f. Insulate hangers for copper pipe from piping by means of at least two layers of Scotch 33 plastic tape.

END OF SECTION

SECTION 22 05 53**IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT****PART 1 - GENERAL****1.1 SUMMARY**

- A. Related Documents:
 - 1. Drawings and general provisions of the Subcontract apply to this Section.
 - 2. Review these documents for coordination with additional requirements and information that apply to work under this Section.
- B. Section Includes:
 - 1. Identify all installed mechanical distribution piping, mechanical equipment and components.
 - 2. Cast-in-place concrete.
- C. Related Sections:
 - 1. Division 01 Section "General Requirements."
 - 2. Division 01 Section "Special Procedures."
 - 3. Division 09 Section "Painting" for identification painting.

1.2 REFERENCES

- A. General:
 - 1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
 - 2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
 - 3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.
 - 4. Refer to Division 22 Section "Common Results for Plumbing" for codes and standards, and other general requirements.
- B. ASME –American Society of Mechanical Engineers:
 - 1. ASME A 13.1 Scheme for the identification of piping systems

1.3 SUBMITTALS

- A. Submit under provisions of Division 22 Section "Common Results for Plumbing, Review of Materials" and Division 01 Section "General Requirements."
- 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. Submit valve database as per Part 3.05 -Stenciling and Identification, D.3 - Valve Tags.
- E.

2.1 ACCEPTABLE MANUFACTURERS

- A. W. H. Brady or Westline products.
- B. No substitutions.

2.2 MATERIALS

- A. Color coding: ASME A13.1 unless specified otherwise.
- B. Plastic nameplates: laminated two-layer plastic with engraved black letters on light, contrasting background color.
- C. Plastic tags: laminated three-layer (double-sided) plastic with engraved black letters on light, contrasting background color. Tag size at least 1-1/2 inch (38 mm) diameter.
- D. Stencils: with clean-cut symbols and letters of following size:

Outside Diameter of Insulation or Pipe	Color Field Length	Letter Height
¾ to 1-1/4 inches (9.5 to 31.7 mm)	8 inches (200 mm)	½ inch (13 mm)
1-1/2 to 2 inches (38.1 to 50.8 mm)	8 inches (200 mm)	¾ inch (20 mm)
2-1/2 to 2 inches (63.5 to 50.8 mm)	12 inches (300 mm)	1 ¼ inch (32 mm)
8 to 10 inches (203.2 to 254 mm)	24 inches (600 mm)	2 ½ inch (64 mm)
Over 10 inches (254 mm)	32 inches (800 mm)	3 inches (75 mm)
Ductwork and equipment	---	2 ½ inch (64 mm)

- E. Stencil paint: semi-gloss enamel; in accordance with Division 09 Section "Painting".
- F. Plastic pipe markers: factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and fluid being conveyed.
 - 1. Special gases shall be identified using markers with yellow background and black letters, direction arrow, and full chemical names and symbols.
- G. Plastic-tape pipe markers: flexible, vinyl-film tape with pressure-sensitive adhesive backing and printed markings.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive adhesive of identification materials.
- B. Prepare surfaces in accordance with Division 09 Section "Painting" for stencil painting.

3.2 INSTALLATION

- A. Plastic nameplates: install with corrosion-resistant mechanical fasteners, or adhesive.
- B. Plastic tags: install with corrosion-resistant chain.
- C. Stencil painting: apply in accordance with Division 09 Section "Painting".
- D. Plastic pipe markers: install in accordance with manufacturer's instructions.
- E. Plastic-tape pipe markers: install completely around pipe in accordance with manufacturer's instructions.
- F. Underground plastic pipe markers: install 6 to 8 inches (150 to 200 mm) below finished grade, directly above buried pipe.

3.3 IDENTIFICATION SCHEDULE

- A. Equipment: identify air-handling units, pumps, heat-transfer equipment, tanks, and water-treatment devices with plastic nameplates. Small devices, such as in-line pumps, may be identified with plastic tags.
- B. Controls: identify control panels and major control components outside of panels with plastic nameplates.
- C. Valves: identify valves in main and branch piping with tags.
- D. Piping: identify piping, concealed or exposed, with stenciled painting. Tags may be used on small diameter piping. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not more than 20 feet (6 m) apart 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.
- E. Ductwork: identify ductwork with stenciled painting. Identify as to air-handling unit number, and area served. Locate identification at air-handling unit, at each side of penetration of structure or enclosure, and at each obstruction.

3.4 VALVE DATABASE

- A. Provide specified valve database.

3.5 STENCILING AND IDENTIFICATION

- A. Stencil each piece of new and existing equipment including pumps, fans, tanks, etc., with the equipment tags scheduled on the drawings. Use minimum 2 inches (50 mm) high characters.
 - 1. Stencil each duct leaving the mechanical room indicating fan unit, area(s), direction of flow, or room(s) served.
 - 2. Stencil each duct branch leaving an air shaft at each floor with fan number, and identify it as a supply, exhaust, or return duct, and indicate direction of air flow.
- B. Post a framed and typewritten schedule of all stencils, pipe markers, valve tags, and lubricants used, with identification, shall be framed and posted in the mechanical equipment room.
- C. Identify all pipes with specified markers.
 - 1. Install markers every 10 feet (3 m) on mains, at all branch take-offs and adjacent to valves and cocks.

2. Apply to all exposed pipes, pipes behind removable tile ceiling, pipes in concealed but accessible locations, such as behind access panels and at least once in each room.
 3. Install pipe marker using pressure sensitive adhesive in accordance with the manufacturer's directions. The marker shall completely cover the circumference of the pipe and overlap itself.
- D. Valve Tags: Provide numbered tags for main valves, branch valves, zone valves, shut-off valves, and balancing valves installed under this Contract, constructed of #18 gauge (1.02 mm) brass, circular, 1 ¼ inches (31.7 mm) in diameter, and with numbers cut in and blackened so as to be plainly discernible. Fasten tags to valve with brass links.
1. Valve numbers not required for valves obviously serving equipment such as air handler coils, reheat coil valves, and miscellaneous drains.
 2. On the as-built drawings, indicate the location and number of each tagged valve.
 3. Provide a computer file database in a form agreeable to the University, describing the valve, number, location, type of service normally "open" or "closed", specific duty of each tagged valve, and manufacturer and model number.
- E. Warning Sign at Fume Exhaust Plenums: Place warning sign on each fume exhaust plenum access - "WARNING. HAZARDOUS ATMOSPHERE INSIDE. USE BREATHING APPARATUS" when breaching containment.
- F. Place warning signs on all machines driven by electric motors which are controlled by fully automatic starters. See Section 3320, Article 7, Subchapter 7, General Industry Safety Orders, Title 8, California Code of Regulations.
- G. Fire dampers and fire smoke dampers: at each fire damper or fire smoke damper access panel, label "FIRE DAMPER" or "FIRE SMOKE DAMPER" in minimum 2 inches (25 mm) high letters. Fire smoke dampers shall be provided with tags to identify each fire smoke dampers as "FSD-NUMBER SEQUENCES-BLDG NUMBER". Provide chart to University for approval.
- H. Wherever charts, Shop Drawings, etc. Refer to specific room numbers, use room numbers that will be provided by the university rather than the room numbers indicated on the Drawings.

END OF SECTION

SECTION 22 07 16**PLUMBING PIPING INSULATION****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
1. Furnish and install insulation on hot and cold water lines, fittings, valves, and accessories as described in Contract Documents.
 2. Furnish and install insulation on roof drain piping as described in Contract Documents.
- B. Related Requirements:
1. Section 22 11 16: Domestic Water Piping.

PART 2 - PRODUCTS**2.1 COMPONENTS**

- A. Manufacturers:
1. Manufacturer Contact List:
 - a. Armacell, Mebane, NC www.armacell.com.
 - b. Childers Products Co, Eastlake, OH www.fosterproducts.com.
 - c. IMCOA, Youngsville, NC www.nomacokflex.com.
 - d. Johns-Manville, Denver, CO www.jm.com.
 - e. Knauf, Shelbyville, IN www.knauffiberglass.com.
 - f. Manson, Brossard, PQ, Canada www.isolationmanson.com.
 - g. Nomaco Inc, Yopungsville, NC www.nomacokflex.com.
 - h. Owens-Corning, Toledo, OH www.owenscorning.com.
 - i. Speedline Corp, Solon, OH www.speedlinepvc.com.
- B. Materials:
1. Above Grade Metal Piping:
 - a. Insulation For Piping:
 - 1) Snap-on glass fiber or melamine foam pipe insulation, or heavy density pipe insulation with factory vapor jacket.
 - 2) Insulation Thickness:

Service Water Temperature	Pipe Sizes		
	Up to 1-1/4 In	1-1/2 to 2 In	Over 2 In
170 - 180 Deg F	One In	1-1/2 In	2 In
140 - 160 Deg F	1/2 In	One In	1-1/2 In
45 - 130 Deg F	1/2 In	1/2 In	One In
- | Service Water Temperature | Pipe Sizes | | |
|---------------------------|-------------|-------------|------------|
| | Up to 32 mm | 38 to 50 mm | Over 50 mm |
| 77 - 82 Deg C | 25 mm | 38 mm | 50 mm |
| 60 - 71 Deg C | 13 mm | 25 mm | 38 mm |
| 7 - 54 Deg C | 13 mm | 13 mm | 25 mm |
- 3) Performance Standards: Fiberglas ASJ by Owens-Corning.
 - 4) Type One Acceptable Manufacturers:
 - a) Childers Products.
 - b) Knauf.
 - c) Manson.
 - d) Owens-Corning.

- e) Johns-Manville.
 - f) Equal as approved by Architect before bidding. See Section 01 62 00.
 - b. Fitting, Valve, And Accessory Covers:
 - 1) PVC.
 - 2) Performance Standard: Zeston by Johns-Manville.
 - 3) Type One Acceptable Manufacturers:
 - a) Knauf.
 - b) Speedline.
 - c) Johns-Manville.
 - d) Equal as approved by Architect before bidding. See Section 01 62 00.
- 2. Below Grade Metal Piping:
 - a. Insulation:
 - 1) **1/2 inch 13 mm** thick.
 - 2) Category Four Acceptable Products. See Section 01 62 00 for definition of Categories.
 - a) SS Tubolit by Armacell.
 - b) ImcoLock by Imcoa.
 - c) Nomalock or Therma-Cel by Nomaco.
 - b. Joint Sealant:
 - 1) Category Four Acceptable Products. See Section 01 62 00 for definition of Categories.
 - a) Armacell 520.
 - b) Nomaco K-Flex R-373.
- 3. Pex Piping, Above And Below Grade:
 - a. Insulation:
 - 1) **1/2 inch 13 mm** thick.
 - 2) Category Four Acceptable Products. See Section 01 62 00 for definition of Categories.
 - a) SS Tubolit by Armacell.
 - b) ImcoLock by Imcoa.
 - c) Nomalock or Therma-Cel by Nomaco.
 - b. Joint Sealant:
 - 1) Category Four Acceptable Products. See Section 01 6200 for definition of Categories.
 - a) Armacell 520.
 - b) Nomaco K-Flex R-373.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Above Grade Piping:
 - 1. Apply insulation to clean, dry piping with joints tightly butted.
 - 2. Install insulation in manner to facilitate removal for repairs. Place sections or blocks so least possible damage to insulation will result from inspection or repairs of piping or equipment.
 - 3. Piping up to **1-1/4 Inch 31 mm** Diameter: Adhere 'factory applied vapor barrier jacket lap' smoothly and securely at longitudinal laps with white vapor barrier adhesive. Adhere **3 inch 75 mm** wide self-sealing butt joint strips over end joints.
 - 4. Piping **1-1/2 Inch 39 mm** Diameter And Larger:
 - a. Use broken-joint construction in application of two-layer covering.
 - b. Fill cracks and depressions with insulating cement mixed to thick plastic paste. Apply by hand in several layers to make up total specified thickness. Final layer shall have smooth uniform finish before application of covering.
 - c. Apply PVC jacket.
 - 5. Fittings, Valves, And Accessories:
 - a. Do not apply insulation over flanged joints or victaulic couplings until piping has been brought up to operating temperature and flange bolts have been fully tightened. Insulate valves so wheel, stem, and packing nut are exposed.
 - b. Insulate with same type and thickness of insulation as pipe, with ends of insulation tucked snugly into throat of fitting and edges adjacent to pipe insulation tufted and tucked in.
 - c. Piping Up To **1-1/4 Inch 31 mm** Diameter: Cover insulation with one piece fitting cover secured by stapling or taping ends to adjacent pipe covering.

- 1) Alternate Method: Insulate fittings, valves, and accessories with one inch of insulating cement and vapor seal with two 1/8 inch 3 mm wet coats of vapor barrier mastic reinforced with glass fabric extending 2 inches 50 mm onto adjacent insulation.
 - d. Piping 1-1/2 inches 38 mm To 2 Inches 50 mm: Insulate with hydraulic setting insulating cement or equal, to thickness equal to adjoining pipe insulation. Apply final coat of fitting mastic over insulating cement.
 - e. Piping 2-1/2 inches 63 mm And Larger: Insulate with segments of molded insulation securely wired in place and coated with skim coat of insulating cement. Apply fitting mastic, fitting tape and finish with final coat of fitting mastic.
6. Pipe Hangers:
 - a. Do not allow pipes to come in contact with hangers.
 - b. Provide 16 ga 1.6 mm by 6 inch 150 mm long galvanized shields at each pipe hanger to protect pipe insulation from crushing by clevis hanger.
 7. Protect insulation wherever leak from valve stem or other source might drip on insulated surface, with aluminum cover or shield rolled up at edges and sufficiently large in area and of shape that dripping will not splash on surrounding insulation.
- B. Below Grade Piping: Slip underground pipe insulation onto pipe and seal butt joints. Where slip-on technique is not possible, slit insulation, apply to pipe, and seal seams and joints.

END OF SECTION

SECTION 22 11 16**DOMESTIC WATER PIPING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Perform excavating and backfilling required by work of this Section.
 - 2. Furnish and install potable water piping complete with necessary valves, connections, and accessories inside building and connect with outside utility lines **5 feet 1 500 mm** from building perimeter as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 22 05 01: Common Piping Requirements.
 - 2. Section 22 07 16: Plumbing Piping Insulation.
 - 3. Section 31 23 16: Criteria for performance of excavation.
 - 4. Section 31 23 23: Criteria for performance of backfill.
 - 5. Section 33 11 16: Domestic water piping from **5 feet 1 500 mm** from building perimeter to main.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM B 88-03, 'Standard Specification for Seamless Copper Water Tube.'

1.3 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data: Manufacturer's literature on PEX pipe and PEX pipe fittings.
 - 2. Sample: PEX pipe fitting.
- B. Informational Submittals:
 - 1. Test And Evaluation Reports: Written report of sterilization test.

PART 2 - PRODUCTS**2.1 SYSTEMS**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Armstrong International Inc, Three Rivers, MI www.armstrong-intl.com.
 - b. Bell & Gossett, Morton Grove, IL www.bellgossett.com.
 - c. Cash Acme, Cullman, AL www.cashacme.com
 - d. Cla-Val Company, Costa Mesa, CA www.cla-val.com.
 - e. Conbraco Industries Inc, Matthews, NC www.conbraco.com.
 - f. Hammond Valve, New Berlin, WI www.hammondvalve.com.
 - g. Handy & Harmon Products Div, Fairfield, CT www.handyharmon.com.
 - h. Harris Products Group, Cincinnati, OH www.harrisproductsgroup.com.
 - i. Jenkins Valves Inc, Brantford, ON www.cranevalve.com.
 - j. Leonard Valve Co, Cranston, RI www.leonardvalve.com.
 - k. Milwaukee Valve Co, New Berlin, WI www.milwaukeevalve.com.

- l. Mueller Co, Decatur, IL www.muellerflo.com.
- m. Nibco Inc, Elkhart, IN www.nibco.com.
- n. PowersControls, Buffalo Grove, IL www.powerscontrols.com.
- o. Rehau, Leesburg, VA www.rehau-na.com.
- p. Sloan Valve Co, Franklin Park, IL www.sloanvalve.com.
- q. Spence Engineering Co, Walden, NY www.spenceengineering.com.
- r. Stockham Valves, Cullman, AL www.stockham.com.
- s. Symmons Industries, Braintree, MA www.symmons.com.
- t. Taco Inc, Cranston, RI or Mississauga, ON www.taco-hvac.com.
- u. Uponor Inc, Apple Valley, MN www.uponor-usa.com.
- v. Viega ProPress, Wichita, KS www.viega-na.com.
- w. Watts Regulator Co, Andover, MA www.wattsreg.com.
- x. Wilkins Operation, Paso Robles, CA www.zurn.com.

B. Materials

1. Pipe:

a. Copper:

- 1) Above-Grade: Meet requirements of ASTM B 88, Type L.
- 2) Below-Grade:
 - a) Meet requirements of ASTM B 88, Type K. **3/4 inch 19 mm** minimum under slabs.
 - b) **2 inches 50 mm** And Smaller: Annealed soft drawn.
 - c) **2-1/2 inches 63 mm** And Larger: Hard Drawn.

b. Cross-Linked Polyethylene (PEX):

- 1) Certified with NSF International against NSF Standards 14 and 61 and NSF Protocol 171.
- 2) Copper tube size (CTS) outside dimensions and Standard Dimension Ratio (SDR) of 9.
- 3) Pressure rated for 160 psi at 73 deg F, 100 psi at 180 deg F, and 80 psi at 200 deg F.
- 4) Marked with Manufacturer's name, design pressure and temperature ratings, and third party certification stamp for NSF-PW.
- 5) Manufactured by Engel or peroxide method (PEX-A) or by silane method (PEX-B).
- 6) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Raupex by Rehau.
 - b) Wirsbo Aquapex by Uponor.
 - c) ViegaPEX by Viega.

2. Fittings:

a. For Copper Pipe: Wrought copper.

b. For PEX Pipe:

- 1) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Everloc by Rehau.
 - b) Propex by Uponor including EP flow-through multiport tees.
 - c) F877 bronze fitting with stainless steel press sleeve by Viega.

3. Connections For Copper Pipe:

a. Above-Grade:

- 1) Sweat copper type with 95/5 or 96/4 Tin-Antimony solder, Bridgit solder, or Silvabrite 100 solder. Use only lead-free solder.
- 2) Viega ProPress System

b. Below Grade:

- 1) Brazed using following type rods:
 - a) Copper to Copper Connections:
 - (1) AWS Classification BCuP-4 Copper Phosphorus (6 percent silver).
 - (2) AWS Classification BCuP-5 Copper Phosphorus (15 percent silver).
 - 2) Copper to Brass or Copper to Steel Connections: AWS Classification BAg-5 Silver (45 percent silver).
- 3) Do not use rods containing Cadmium.
- 4) Brazing Flux:
 - a) Approved Products:
 - (1) Stay-Silv white brazing flux by Harris Product Group.
 - (2) High quality silver solder flux by Handy & Harmon.
- 5) Joints under slabs acceptable only if allowed by local codes.

4. Ball Valves:

- a. Use ball valves exclusively unless otherwise specified. Ball valves shall be by single manufacturer from approved list below.
 - b. Valves shall be two-piece, full port for 150 PSI SWP.
 - 1) Operate with flow in either direction, suitable for throttling and tight shut-off. Full port, three-piece maintenance design.
 - 2) Body: Bronze, 150 psig wsp at 350 deg F and 400 psig wog.
 - 3) Seat: Bubble tight at 100 psig under water.
 - c. Class One Quality Standard: Nibco T585 or S585.
 - 1) Equal by Conbraco 'Apollo,' Hammond, Milwaukee, or Watts.
5. Combination Pressure Reducing Valve / Strainer:
- a. Integral stainless steel strainer, or separate 'Y' strainer installed upstream of pressure reducing valve.
 - b. Built-in thermal expansion bypass check valve.
 - c. Class One Quality Standard: Watts U5B.
 - 1) Equal by Cash Acme, Cla-Val Hi Capacity, Conbraco 36C, Honeywell-Braukmann, Spence Hi Capacity, Watts, or Wilkins. See Section 01 6200.
6. Mixing Valve MV-1:
- a. Solid brass construction and CSA B125 certified.
 - b. Includes integral check valves and inlet screen. Features advanced paraffin-based actuation technology.
 - c. Flow of 11 GPM with maximum 10 psi pressure drop. Perform to minimum flow of 0.5 GPM in accordance with ASSE 1017-2003.
 - d. Set for **110 deg F 43 deg C** Service.
 - e. Class One Quality Standard: Powers LM492-10. See Section 01 6200.
 - f. Acceptable Manufacturers: Leonard, Powers, Sloan, Symmons, and Watts.
7. Mixing Valve MV-2:
- a. Solid brass construction and CSA B125 certified.
 - b. Includes integral check valves and inlet screen. Features advanced paraffin-based actuation technology.
 - c. Flow of 5.7 GPM with maximum 10 psi pressure drop. Perform to minimum flow of 0.5 GPM in accordance with ASSE 1016 and 1070.
 - d. Set for **110 deg F 43 deg C** Service.
 - e. Class One Quality Standard: Powers LM495. See Section 01 6200.
 - f. Acceptable Manufacturers: Leonard, Powers, Sloan, Symmons, and Watts.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Below Grade:
1. Install piping under slabs without joints where possible.
 2. Insulate water piping buried within building perimeter.
 3. Bury water piping **6 inches 150 mm** minimum below bottom of slab and encase in **2 inches 50 mm** minimum of sand.
- B. Locate cold water lines a minimum of **6 inches 150 mm** from hot water line.

3.2 FIELD QUALITY CONTROL

- A. Field Tests:
1. Before pipes are covered, test systems in presence of Architect at **125 psi 862 kPa** hydrostatic pressure for 4 hours and show no leaks. Disconnect equipment not suitable for **125 psig 862 kPa** pressure from piping system during test period.

3.3 CLEANING

- A. Sterilize potable water system with solution containing 200 parts per million minimum of available chlorine and maintaining pH of 7.5 minimum. Introduce chlorinating materials into system in manner approved by Architect. Allow sterilization solution to remain for 24 hours and open and close valves and faucets several times during that time.
- B. After sterilization, flush solution from system with clean water until residual chlorine content is less than 0.2 parts per million.
- C. Water system will not be accepted until negative bacteriological test is made on water taken from system. Repeat dosing as necessary until such negative test is accomplished.

END OF SECTION

SECTION 22 13 19**FACILITY SANITARY SEWER SPECIALTIES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install miscellaneous sanitary sewer specialties as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 22 05 01: Common Plumbing Requirements.

PART 2 - PRODUCTS**2.1 SYSTEMS**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. H-M Company, Cincinnati, OH www.draintroughs.com.
 - b. Josam Co, Michigan City, IN www.josam.com.
 - c. Jay R. Smith Manufacturing Co, Montgomery, AL www.jrsmith.com.
 - d. Mifab Manufacturing Inc, Chicago, IL www.mifab.com.
 - e. Scherping Systems, Winstead, MN www.scherpingsystems.com.
 - f. Sioux Chief Manufacturing Co, Peculiar, MO www.siouxchief.com.
 - g. Wade Div Tyler Pipe, Tyler, TX www.wadedrains.com.
 - h. Watts Drainage, Spindale, NC www.watts.com.
 - i. Zurn Cast Metal, Erie, PA www.zurn.com.
- B. Components:
 - 1. Drains And Drain Accessories:
 - a. Floor Drain FD-1:
 - 1) Approved types with deep seal trap and chrome plated strainer.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Josam: 30000-50-Z-5A with 88250 trap.
 - b) J. R. Smith: 2010-A with 7222 trap.
 - c) Wade: 1100 with 2450-T trap.
 - d) Zurn: Z-415 with Z 1000 trap.
 - b. Floor Drain FD-2:
 - 1) Approved types with shallow trap, chrome plated 5 inch 125 mm diameter strainer, and 2-1/2 to 4 inch 63 to 100 mm diameter by 4-1/4 inch 106 mm high chrome plated funnel.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Josam: 30000-50-Z-E2-CP.
 - b) J. R. Smith: 3520-F11-CP.
 - c) Zurn: Z-450.
 - c. Floor Drain FD-4:
 - 1) Approved types with deep seal trap and chrome plated strainer, and 2-1/2 to 4 inch 63 to 100 mm diameter by 4-1/4 inch 106 mm high chrome plated funnel.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Josam: 30000-50-Z-5A-CP with 88252 trap.
 - b) J. R. Smith: 3510-F11-CP with 7222 trap.
 - c) Wade: 1100 with 2450-T trap.
 - d) Zurn: 415 with Z 1000 trap.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 22 42 16**COMMERCIAL LAVATORIES AND SINKS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install plumbing fixtures as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 07 92 13: Sealants used between fixtures and other substrates.
 - 2. Section 22 05 01: Common Mechanical Requirements.
 - 3. Section 22 11 16: Domestic Water Piping.

PART 2 - PRODUCTS**2.1 ASSEMBLIES**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. American Standard Plumbing, Piscataway, NJ www.americanstandard.com.
 - b. BrassCraft Manufacturing Co, Novi, MI www.brasscraft.com.
 - c. Brocar Products Inc, Cincinnati, OH www.brocar.com.
 - d. CECO, Huntington Park, CA www.cecosinks.com.
 - e. Chicago Faucet Co, Des Plaines, IL www.chicagofaucets.com.
 - f. Dearborn Brass, Tyler, TX www.dearbornbrass.com.
 - g. Delta Faucet Co, Indianapolis, IN www.deltafaucet.com.
 - h. Eljer Plumbingware, Dallas, TX www.eljer.com.
 - i. Elkay Manufacturing Co, Oak Brook, IL www.elkay.com.
 - j. Fiat Products, Evanston, IL www.cranepumbing.com.
 - k. Josam Co, Michigan City, IN www.josam.com.
 - l. Jay R. Smith Manufacturing Co, Montgomery, AL www.jrsmith.com.
 - m. Just Manufacturing Co, Franklin Park, IL www.justsinks.com.
 - n. Keeney Manufacturing Co, Newington, CT www.keeneymfg.com.
 - o. Kohler Co Plumbing Div, Kohler, WI www.us.kohler.com.
 - p. McGuire Manufacturing Co, Cheshire, CT www.mcguiremfg.com.
 - q. Mifab Manufacturing Inc, Amherst, NY www.mifab.com.
 - r. Moen Incorporated, North Olmsted, OH www.moen.com.
 - s. Omni Flow Controls, Harbor City, CA www.chronomite.com or www.omniflowcontrols.com.
 - t. Sloan Valve Co, Franklin Park, IL www.sloanvalve.com.
 - u. Speakman Company, New Castle, DE www.speakmancompany.com.
 - v. Stern-Williams, Shawnee Mission, KS www.sternwilliams.com.
 - w. Symmons, Braintree, MA www.symmons.com.
 - x. T & S Brass & Bronze Works Inc, Travelers Rest, SC www.tsbrass.com.
 - y. TrueBro Inc, Collierville, TN www.truebro.com.
 - z. Wade Div Tyler Pipe, Tyler, TX www.wadedrains.com.
 - aa. Watts Drainage, Spindale, NC www.wattsdrainage.com.
 - bb. Zurn Commercial Brass, Sanford, NC www.zurn.com.
 - cc. Zurn Cast Metal, Erie, PA www.zurn.com.
- B. Performance:
 - 1. Design Criteria:

- a. Interior exposed pipe, valves, and fixture trim, including trim behind custom casework doors, shall be chrome plated.
- C. Components:
- 1. Lavatories And Fittings:
 - a. Standard Counter Top Lavatories:
 - 1) Size **20 by 17 inches 500 by 425 mm** (maximum).
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) American Standard: Aqualyn 0476.028.
 - b) Eljer: Laura 051-3514.
 - c) Kohler: Pennington K-2196-4N.
 - b. Standard Self Supporting Lavatories:
 - 1) Size: **20 by 18 inches 500 by 450 mm**.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) American Standard: Lucern 0355.012.
 - b) Eljer: Delwyn 051-1634.
 - c) Kohler: Greenwich K-2023.
 - 3) Carrier / Support:
 - a) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) Josam.
 - (2) Jay R. Smith.
 - (3) Wade.
 - c. Handicap Accessible Counter Top Lavatories:
 - 1) Size **20 by 17 inches 500 by 425 mm** maximum.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) American Standard: Aqualyn 0476.028.
 - b) Eljer: Laura 051-3514.
 - c) Kohler: Pennington K-2196-4N.
 - d. Handicap Accessible Self Supporting Lavatories:
 - 1) Size: **20 by 27 inches 500 by 650 mm**.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) American-Standard: Wheelchair Lavatory 9141.011.
 - b) Eljer: Wheelchair 051-2964.
 - c) Kohler: Morningside K-12638.
 - 3) Carrier / Support:
 - a) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) Josam.
 - (2) Jay R. Smith.
 - (3) Wade.
 - e. Lavatory Fittings:
 - 1) Faucet and Drain:
 - a) Hard-wired automatic faucet.
 - b) Cast brass spout with chrome finish.
 - c) 4-inch cover plate.
 - d) Mechanical mixing valve.
 - e) Solenoid valve.
 - f) Control module and transformer.
 - g) Hermetically sealed electronics.
 - h) Inlet checks and strainer.
 - i) Category Four Approved Product. See Section 01 6200 for definitions of Categories.
 - (1) Moen: 8306 with McGuire 155A grid strainer
 - (2) Speakman: S-8811 with S-3440 grid drain.
 - (3) Symmons: S6080-AC-G with checks and mixing valve.
 - (4) Zurn: Z6913-CWB with grid strainer.
 - f. Double Compartment Sinks:
 - 1) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Elkay: LR 3319.

- b) Just: DL-1933-A-GR.
- g. Single Compartment Sinks:
 - 1) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Elkay: LR 1918.
 - b) Just: SL-2017-A-GR.
- h. Single Compartment Sink:
 - 1) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Elkay: LR-2219.
 - b) Just: SL-1921-AG-R.
 - 2) Faucets for Standard Double and Single Compartment Sinks:
 - a) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) American Standard: Heritage Kitchen Faucet with Lever Handles 7270.342H.
 - (2) Chicago: 1888CP.
 - (3) Delta: 27C2243-S6
 - (4) Kohler: K-7761-K with handles K-16012-5.
 - (5) Moen: 8227.
 - (6) Speakman: SC-5724.
 - (7) Zurn Commercial Brass: Z-831J3.
 - 3) Faucets for Sacrament Preparation Room Sink:
 - a) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) American Standard: Pantry / Service Sink 7100.241H.
 - (2) Chicago: 350-CP.
 - (3) Delta: 27T643-R4.
 - (4) Kohler: K-7895-C.
 - (5) Moen: 8103
 - (6) Speakman: SC-7112.
 - (7) T & S: 0305-01.
 - (8) Zurn: Z-825B1FC.
 - 4) Supply pipes with stops:
 - a) Provide chrome plated quarter-turn brass ball valve, 12 inch long braided stainless steel riser, and chrome-plated steel flange.
 - b) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) McGuire: BV2165CC.
 - (2) Zurn: Z8804 LRQ-PC.
 - 5) Flow Control Fitting:
 - a) Provide vandal-proof type in place of aerator. Flow shall be 2.0 gpm.
 - b) Category Four Approved Product. See Section 01 6200 for definitions of Categories.
 - (1) Omni A-200 Series by Chronomite Laboratories.
 - 6) Waste For Standard Stainless Steel Sinks:
 - a) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) Elkay: LK-99.
 - (2) Kohler: K8801.
 - (3) McGuire: 151
 - (4) Zurn Z-8740-PC.
 - 7) Waste For Sacrament Preparation Room Sink:
 - a) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) Eljer: 803-0570.
 - (2) Elkay: LKKDT35.
 - (3) Just: JDB-35.
 - (4) Kohler: K8807.
 - (5) McGuire: 152
 - (6) Zurn Z-8739-PC.
 - 8) Trap:

- a) 17 ga 1.4 mm tube 'P' trap, chrome plated.
 - b) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) Dearborn.
 - (2) Keeney Manufacturing.
 - (3) McGuire: MCT150075NCZN.
 - (4) Zurn.
- 2. Miscellaneous Sinks And Fittings:
 - a. Service Sink:
 - 1) Floor Type, enameled cast iron, 28 inches 700 mm square with vinyl coated rim guard or 24 inches 600 mm square with Stainless Steel rim guard.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) American Standard: Florwell Cast Iron 7741.000 with rim guard 7745.811
 - b) CECO: 871
 - c) Eljer: Custodial 242-0050.
 - d) Fiat: TSBC-1610.
 - e) Kohler: Whitby K-6710.
 - f) Zurn: 5850.
 - 3) Service Sink Fittings:
 - a) Supply:
 - (1) Mounting height of 42 inches 1 050 mm.
 - (2) Provide 48 inch 1 200 mm hose and clamp unless spout is threaded.
 - (3) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (a) American Standard: Service Sink Faucet 8344.112 with threaded spout.
 - (b) Chicago: 897 CP.
 - (c) Delta: 28T9 with 28T911 hose and bracket.
 - (d) Kohler: K-8928.
 - (e) Moen: 8124
 - (f) Speakman: SC-5812.
 - (g) T&S: B-0665-BSTP.
 - (h) Zurn: Z-843M1.
 - b) Drain and Strainer:
 - (1) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (a) American Standard: Grid strainer 7721.038.
 - (b) Eljer: 803-0630.
 - (c) Kohler: K-9146, 3 inch IPS.
 - c) Trap: Cast iron, PVC, or ABS to match piping.
 - b. Floor Sink:
 - 1) 8 inch square top, medium receptor cast iron body with flanged receptor, acid resistant coated interior, and acid resistant coated half grate. Aluminum sediment bucket and 2 inch calked regular outlet connection.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Jay R. Smith: 3411-12.
 - b) Josam: 49300-3-Z.
 - c) Wade: W9112-15-64-1C.
 - d) Zurn: Z-1910-2.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install each fixture with separate vent line. Do not circuit vent.
- B. Ensure provisions are made for proper support of fixtures and that rough-in piping is accurately set and protected from movement and damage.

- C. Seal wall-mounted fixtures around edges to wall and counter top fixtures to countertop with sealant specified in Section 07 9213.
- D. Unless otherwise noted, provide each individual fixture supply with chrome-plated stop valve with hand wheel.
- E. Install fixtures with accessible stop or control valve in each hot and cold water branch supply line.
- F. Self-Supporting Lavatories: Install using carriers. Support carrier free of finished wall.

3.2 CLEANING

- A. Polish chrome finish at completion of Project.

END OF SECTION

DIVISION 23: HEATING, VENTILATING, AND AIR-CONDITIONING

23 0000 HEATING, VENTILATING, AND AIR-CONDITIONING

23 0501 COMMON HVAC REQUIREMENTS
23 0529 HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
23 0548 VIBRATION AND SEISMIC CONTROLS FOR HVAC PIPING AND EQUIPMENT
23 0553 IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
23 0716 DUCT INSULATION
23 0719 HVAC PIPING INSULATION

23 2000 HVAC PIPING AND PUMPS

23 2300 REFRIGERANT PIPING
23 2600 CONDENSATE DRAIN PIPING

23 3000 HVAC AIR DISTRIBUTION

23 3001 COMMON DUCT REQUIREMENTS
23 3111 HIGH PRESSURE DUCTWORK
23 3300 AIR DUCT ACCESSOIRES
23 3346 FLEXIBLE DUCTS
23 3400 HVAC FANS
23 3713 DIFFUSERS, REGISTERS, AND GRILLES
23 3714 LOUVERS AND VENTS

23 4000 HVAC AIR CLEANING DEVICES

23 4100 AIR FILTERS

23 6000 CENTRAL COOLING EQUIPMENT

23 6213 AIR-COOLED REFRIGERANT CONDENSERS

23 8000 DECENTRALIZED HVAC EQUIPMENT

23 8216 AIR COILS

END OF TABLE OF CONTENTS



SECTION 23 05 01**COMMON HVAC REQUIREMENTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Common requirements and procedures for HVAC systems.
 - 2. Responsibility for proper operation of electrically powered equipment furnished under this Division.
 - 3. Interface with Testing And Balancing Agency.
 - 4. Furnish and install sealants relating to installation of systems installed under this Division.
 - 5. Furnish and install Firestop Penetration Systems for HVAC system penetrations as described in Contract Documents.
 - 6. Furnish and install sound, vibration, and seismic control elements.
- B. Products Furnished But Not Installed Under This Section:
 - 1. Sleeves, inserts, and equipment for mechanical systems installed under other Sections.
- C. Related Requirements:
 - 1. Section 03 30 53: Exterior concrete pads and bases for mechanical equipment.
 - 2. Section 05 05 23: Quality and requirements for welding.
 - 3. Section 07 84 00: Quality of Penetration Firestop Systems to be used on Project and submittal requirements.
 - 4. Section 07 92 13: Quality of sealants used at building exterior.
 - 5. Section 07 92 19: Quality of acoustical sealants.
 - 6. Sections Under 09 90 00 Heading: Painting of mechanical items requiring field painting.
 - 7. Section 26 29 13: Magnetic starters and thermal protective devices (heaters) not factory mounted integral part of mechanical equipment.
 - 8. Division 26: Raceway and conduit, unless specified otherwise, line voltage wiring, outlets, and disconnect switches.
 - 9. Slots and openings through floors, walls, ceilings, and roofs provided under other Divisions in their respective materials.
 - 10. Sections Under 33 50 00 Heading: Fuel Distribution Utilities.

1.2 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Manufacturer's catalog data for each manufactured item.
 - 1) Provide section in submittal for each type of item of equipment. Include Manufacturer's catalog data of each manufactured item and enough information to show compliance with Contract Document requirements. Literature shall show capacities and size of equipment used and be marked indicating each specific item with applicable data underlined.
 - 2) Include name, address, and phone number of each supplier.
 - 2. Shop Drawings:
 - a. Schematic control diagrams for each separate fan system, heating system, control panel, etc. Each diagram shall show locations of all control and operational components and devices. Mark correct operating settings for each control device on these diagrams.

- b. Diagram for electrical control system showing wiring of related electrical control items such as firestats, fuses, interlocks, electrical switches, and relays. Include drawings showing electrical power requirements and connection locations.
 - c. Drawing of each temperature control panel identifying components in panels and their function.
 - d. Other shop drawings required by Division 23 trade Sections.
- B. Closeout Submittals:
 - 1. Operation And Maintenance Manual Data:
 - a. Modify and add to requirements of Section 01 7000 as follows:
 - 1) At beginning of HVAC section of Operations And Maintenance Manual, provide master index showing items included.
 - 2) Provide name, address, and phone number of Architect, Architect's Mechanical Engineer, General Contractor, and HVAC, Sheet Metal, Refrigeration, and Temperature Control subcontractors.
 - 3) Provide operating instructions to include:
 - a) General description of each HVAC system.
 - b) Step by step procedure to follow in putting each piece of HVAC equipment into operation.
 - c) Provide diagrams for electrical control system showing wiring of items such as smoke detectors, fuses, interlocks, electrical switches, and relays.
 - 4) Identify maintenance instructions by using same equipment identification used in Contract Drawings. Maintenance instructions shall include:
 - a) List of HVAC equipment used indicating name, model, serial number, and nameplate data of each item together with number and name associated with each system item.
 - b) Manufacturer's maintenance instructions for each piece of HVAC equipment installed in Project. Instructions shall include name of vendor, installation instructions, parts numbers and lists, operation instructions of equipment, and maintenance and lubrication instructions.
 - c) Summary list of mechanical equipment requiring lubrication showing name of equipment, location, and type and frequency of lubrication.
 - d) Manual for Honeywell T7350 thermostat published by Honeywell.
 - 5) Include copies of approved shop drawings and copies of warranties required in individual Sections of Division 23.

1.3 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. Perform work in accordance with applicable provisions of Gas Ordinances applicable to Project. Provide materials and labor necessary to comply with rules, regulations, and ordinances.
 - 2. In case of differences between building codes, laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Notify Architect in writing of such differences before performing work affected by such differences.
- B. Identification:
 - 1. Motor and equipment name plates as well as applicable UL / ULC and AGA / CGA labels shall be in place when Project is turned over to Owner.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Accept valves on site in shipping containers with labeling in place.
- B. Storage:
 - 1. In addition to requirements specified in Division 01:
 - a. Stored material shall be readily accessible for inspection by Architect until installed.

- b. Store items subject to moisture damage, such as controls, in dry, heated spaces.
 - 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.
- C. Handling: Protect bearings during installation. Thoroughly grease steel shafts to prevent corrosion.

1.5 WARRANTY

- A. Guarantee HVAC systems to be free from noise in operation that may develop from failure to construct system in accordance with Contract Documents.
- B. Provide certificates of warranty for each piece of equipment made out in favor of Owner. Clearly record 'start-up' date of each piece of equipment on certificate.
- C. If HVAC sub-contractor with offices located more than 150 miles 240 km from Project site is used, provide service / warranty work agreement for warranty period with local HVAC sub-contractor approved by Architect. Include copy of service / warranty agreement in warranty section of Operation And Maintenance Manual.

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Components shall bear Manufacturer's name and trade name. Equipment and materials of same general type shall be of same make throughout work to provide uniform appearance, operation, and maintenance.
- B. Valves: Valves of same type shall be of same manufacturer.
- C. Pipe And Pipe Fittings: Use domestic made pipe and pipe fittings on Project. Weld-O-Let and Screw-O-Let fittings are acceptable.
- D. Sleeves:
 - 1. In Framing: Standard weight galvanized iron pipe, Schedule 40 PVC, or 14 ga 2 mm galvanized sheet metal two sizes larger than bare pipe or insulation on insulated pipe.
 - 2. In Concrete And Masonry: Sleeves through outside walls, interior shear walls, and footings shall be schedule 80 black steel pipe with welded plate.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Drawings:
 - 1. HVAC Drawings show general arrangement of piping, ductwork, equipment, etc. Follow as closely as actual building construction and work of other trades will permit.
 - 2. Consider Architectural and Structural Drawings part of this work insofar as these drawings furnish information relating to design and construction of building. These drawings take precedence over HVAC Drawings.
 - 3. Because of small scale of Drawings, it is not possible to indicate all offsets, fittings, and accessories that may be required. Investigate structural and finish conditions affecting this work and arrange work accordingly, providing such fittings, valves, and accessories required to meet conditions.

B. Verification Of Conditions:

1. Examine premises to understand conditions that may affect performance of work of this Division before submitting proposals for this work. Examine adjoining work on which mechanical work is dependent for efficiency and report work that requires correction.
2. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions.
3. Ensure that items to be furnished fit space available. Make necessary field measurements to ascertain space requirements including those for connections and furnish and install equipment of size and shape so final installation shall suit true intent and meaning of Contract Documents. If approval is received by Addendum or Change Order to use other than originally specified items, be responsible for specified capacities and for ensuring that items to be furnished will fit space available.
4. Check that slots and openings provided under other Divisions through floors, walls, ceilings, and roofs are properly located. Perform cutting and patching caused by neglecting to coordinate with Divisions providing slots and openings at no additional cost to Owner.

3.2 PREPARATION**A. Changes Due To Equipment Selection:**

1. Where equipment specified or otherwise approved requires different arrangement or connections from that shown in Contract Documents, submit drawings, if requested by Architect, showing proposed installations.
2. If proposed changes are approved, install equipment to operate properly and in harmony with intent of Contract Documents. Make incidental changes in piping, ductwork, supports, installation, wiring, heaters, panelboards, and as otherwise necessary.
3. Provide any additional motors, valves, controllers, fittings, and other additional equipment required for proper operation of system resulting from selection of equipment.
4. Be responsible for the proper location of roughing-in and connections provided under other Divisions.

3.3 INSTALLATION**A. Interface With Other Work:**

1. Furnish sleeves, inserts, supports, and equipment that are to be installed by others in sufficient time to be incorporated into construction as work proceeds. Locate these items and see they are properly installed.
2. Electrical: Furnish exact location of electrical connections and complete information on motor controls to installer of electrical system.
3. Testing And Balancing:
 - a. Put HVAC systems into full operation and continue their operation during each working day of testing and balancing.
 - b. Make changes in pulleys, belts, fan speeds, and dampers or add dampers as required for correct balance as recommended by Testing And Balancing Agency and at no additional cost to Owner.

B. Cut carefully to minimize necessity for repairs to previously installed or existing work. Do not cut beams, columns, or trusses.**C. Locating Equipment:**

1. Arrange pipes, ducts, and equipment to permit ready access to valves, cocks, unions, traps, filters, starters, motors, control components, and to clear openings of doors and access panels.
2. Adjust locations of pipes, ducts, switches, panels, and equipment to accommodate work to interferences anticipated and encountered.
3. Install HVAC work to permit removal of equipment and parts of equipment requiring periodic replacement or maintenance without damage to or interference with other parts of equipment or structure.

4. Determine exact route and location of each pipe and duct before fabrication.
 - a. Right-Of-Way:
 - 1) Lines that pitch shall have right-of-way over those that do not pitch. For example, steam, steam condensate, and drains shall normally have right-of-way.
 - 2) Lines whose elevations cannot be changed shall have right-of-way over lines whose elevations can be changed.
 - b. Offsets, Transitions, and Changes in Direction:
 - 1) Make offsets, transitions, and changes in direction in pipes and ducts as required to maintain proper head room and pitch of sloping lines whether or not indicated on Drawings.
 - 2) Furnish and install all traps, air vents, sanitary vents, and devices as required to effect these offsets, transitions, and changes in direction.
- D. Piping:
 1. Furnish and install complete system of piping, valved as indicated or as necessary to completely control entire apparatus.
 - a. Pipe drawings are diagrammatic and indicate general location and connections. Piping may have to be offset, lowered, or raised as required or directed at site. This does not relieve this Division from responsibility for proper erection of systems of piping in every respect.
 - b. Arrange piping to not interfere with removal of other equipment, ducts, or devices, or block access to doors, windows, or access openings.
 - 1) Arrange so as to facilitate removal of tube bundles.
 - 2) Provide accessible flanges or ground joint unions, as applicable for type of piping specified, at connections to equipment and on bypasses.
 - a) Make connections of dissimilar metals with di-electric unions.
 - b) Install valves and unions ahead of traps and strainers. Provide unions on both sides of traps.
 - 3) Do not use reducing bushings, street elbows, bull head tees, close nipples, or running couplings.
 - 4) Install piping systems so they may be easily drained. Provide drain valves at low points and manual air vents at high points in hot water heating and cooling water piping.
 - 5) Install piping to insure noiseless circulation.
 - 6) Place valves and specialties to permit easy operation and access. Valves shall be regulated, packed, and glands adjusted at completion of work before final acceptance.
 - c. Do not install piping in shear walls.
 2. Properly make adequate provisions for expansion, contraction, slope, and anchorage.
 - a. Cut piping accurately for fabrication to measurements established at site. Remove burr and cutting slag from pipes.
 - b. Work piping into place without springing or forcing. Make piping connections to pumps and other equipment without strain at piping connection. Remove bolts in flanged connections or disconnect piping to demonstrate that piping has been so connected, if requested.
 - c. Make changes in direction with proper fittings.
 - d. Expansion of Thermoplastic Pipe:
 - 1) Provide for expansion in every 30 feet 9 meters of straight run.
 - 2) Provide 12 inch 300 mm offset below roof line in each vent line penetrating roof.
 3. Provide sleeves around pipes passing through concrete or masonry floors, walls, partitions, or structural members. Do not place sleeves around soil, waste, vent, or roof drain lines passing through concrete floors on grade. Seal sleeves with specified sealants.
 - a. Sleeves through floors shall extend 1/4 inch 6 mm above floor finish in mechanical equipment rooms above basement floor. In other rooms, sleeves shall be flush with floor.
 - b. Sleeves through floors and foundation walls shall be watertight.
 4. Provide spring clamp plates (escutcheons) where pipes run through walls, floors, or ceilings and are exposed in finished locations of building. Plates shall be chrome plated heavy brass of plain pattern and shall be set tight on pipe and to building surface.
 5. Remove dirt, grease, and other foreign matter from each length of piping before installation.
 - a. After each section of piping used for movement of water or steam is installed, flush with clean water, except where specified otherwise.
 - b. Arrange temporary flushing connections for each section of piping and arrange for flushing total piping system.

- c. Provide temporary cross connections and water supply for flushing and drainage and remove after completion of work.
- E. Penetration Firestops: Install Penetration Firestop System appropriate for penetration at HVAC system penetrations through walls, ceilings, roofs, and top plates of walls.
- F. Sealants:
 - 1. Seal openings through building exterior caused by penetrations of elements of HVAC systems.
 - 2. Furnish and install acoustical sealant to seal penetrations through acoustically insulated walls and ceilings.

3.4 REPAIR / RESTORATION

- A. Each Section of this Division shall bear expense of cutting, patching, repairing, and replacing of work of other Sections required because of its fault, error, tardiness, or because of damage done by it.
 - 1. Patch and repair walls, floors, ceilings, and roofs with materials of same quality and appearance as adjacent surfaces unless otherwise shown.
 - 2. Surface finishes shall exactly match existing finishes of same materials.

3.5 FIELD QUALITY CONTROL

- A. Field Tests:
 - 1. Perform tests on HVAC piping systems. Furnish devices required for testing purposes.
 - 2. Replace material or workmanship proven defective with sound material at no additional cost to Owner. Repeat tests on new material, if requested.

3.6 SYSTEM START-UP

- A. Off-Season Start-up:
 - 1. If Substantial Completion inspection occurs during heating season, schedule spring start-up of cooling systems. If inspection occurs during cooling season, schedule autumn start-up for heating systems.
 - 2. Notify Owner seven days minimum before scheduled start-up.
 - 3. Time will be allowed to completely service, test, check, and off-season start systems. During allowed time, train Owner's representatives in operation and maintenance of system.
 - 4. At end of off-season start-up, furnish Owner with letter confirming that above work has been satisfactorily completed.
- B. Preparations that are to be completed before start up and operation include, but are not limited to, following:
 - 1. Dry out electric motors and other equipment to develop and properly maintain constant insulation resistance.
 - 2. Make adjustments to insure that:
 - a. Equipment alignments and clearances are adjusted to allowable tolerances.
 - b. Nuts and bolts and other types of anchors and fasteners are properly and securely fastened.
 - c. Packed, gasketed, and other types of joints are properly made up and are tight and free from leakage.
 - d. Miscellaneous alignments, tightenings, and adjustments are completed so systems are tight and free from leakage and equipment performs as intended.
 - 3. Motors and accessories are completely operable.
 - 4. Inspect and test electrical circuitry, connections, and voltages to be properly connected and free from shorts.
 - 5. Adjust drives for proper alignment and tension.
 - 6. Make certain filters in equipment for moving air are new and of specified type.

7. Properly lubricate and run-in bearings in accordance with Manufacturer's directions and recommendations.

3.7 CLEANING

- A. Clean exposed piping, ductwork, and equipment.
- B. No more than one week before Final Inspection, flush out bearings and clean other lubricated surfaces with flushing oil. Provide best quality and grade of lubricant specified by Equipment Manufacturer.
- C. Replace filters in equipment for moving air with new filters of specified type no more than one week before Final Inspection.

3.8 CLOSEOUT ACTIVITIES

- A. Instruction Of Owner:
 1. Instruct building maintenance personnel and Stake Physical Facilities Representative in operation and maintenance of mechanical systems utilizing Operation And Maintenance Manual when so doing.
 - a. Minimum Instruction Periods:
 - 1) HVAC: Eight hours.
 - 2) Temperature Control: Six hours.
 - b. Minimum Instruction Periods:
 - 1) HVAC and Refrigeration: Four hours.
 - 2) Temperature Control: Four hours.
 - c. Conduct instruction periods after Substantial Completion inspection when systems are properly working and before final payment is made. None of these instructional periods shall overlap another.

3.9 PROTECTION

- A. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system. Cap or plug open ends of pipes and equipment to keep dirt and other foreign materials out of system. Do not use plugs of rags, wool, cotton waste, or similar materials.
- B. Do not operate pieces of equipment used for moving supply air without proper air filters installed properly in system.
- C. After start-up, continue necessary lubrication and be responsible for damage to bearings while equipment is being operated up to Substantial Completion.

END OF SECTION

SECTION 23 05 29**HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
1. Common hanger and support requirements and procedures for HVAC systems.
- B. Related Requirements:
1. Section 05 05 23: Quality and requirements for welding.
 2. Section 07 84 00: Quality of Penetration Firestop Systems to be used on Project and submittal requirements.
 3. Sections Under 09 90 00 Heading: Painting of mechanical items requiring field painting.
 4. Slots and openings through floors, walls, ceilings, and roofs provided under other Divisions in their respective materials.

1.2 SUBMITTALS

- A. Action Submittals:
1. Product Data:
 - a. Manufacturer's catalog data for each manufactured item.

PART 2 - PRODUCTS**2.1 ASSEMBLIES**

- A. Manufacturers:
1. Class Two Quality Standard Approved Manufacturers. See Section 01 6200:
 - a. Anvil International, Portsmouth, NH www.anvilintl.com.
 - b. Cooper B-Line, Highland, IL www.cooperbline.com.
 - c. Erico International, Solon, OH www.erico.com.
 - d. Hilti Inc, Tulsa, OK www.hilti.com.
 - e. Minerallac, Hampshire, IL www.minerallac.com.
 - f. Thomas & Betts, Memphis, TN www.superstrut.com.
 - g. Unistrut, Wayne, MI www.unistrut.com.

B. Performance:

1. Design Criteria:

- a. Support rods for single pipe shall be in accordance with following table:

Rod Diameter	Pipe Size	Rod Diameter	Pipe Size
3/8 inch	2 inches and smaller	10 mm	50 mm and smaller
1/2 inch	2-1/2 to 3-1/2 inches	13 mm	63 mm to 88 mm
5/8 inch	4 to 5 inches	16 mm	100 mm to 125 mm
3/4 inch	6 inches	19 mm	150 mm
7/8 inch	8 to 12 inches	22 mm	200 mm to 300 mm

- b. Support rods for multiple pipes supported on steel angle trapeze hangers shall be in accordance with following table:

Rods		Number of Pipes per Hanger for Each Pipe Size						
No.	Diameter	2 Inch	2.5 Inch	3 Inch	4 Inch	5 Inch	6 Inch	8 Inch
2	3/8 Inch	Two	0	0	0	0	0	0
2	1/2 Inch	Three	Three	Two	0	0	0	0

2	5/8 Inch	Six	Four	Three	Two	0	0	0
2	5/8 Inch	Nine	Seven	Five	Three	Two	Two	0
2	5/8 Inch	Twelve	Nine	Seven	Five	Three	Two	Two

Rods		Number of Pipes per Hanger for Each Pipe Size						
No.	Diameter	50mm	63mm	75mm	100mm	125mm	150mm	200mm
2	10 mm	Two	0	0	0	0	0	0
2	13 mm	Three	Three	Two	0	0	0	0
2	16 mm	Six	Four	Three	Two	0	0	0
2	19 mm	Nine	Seven	Five	Three	Two	Two	0
2	22 mm	Twelve	Nine	Seven	Five	Three	Two	Two

1) Size trapeze angles so bending stress is less than 10,000 psi 69 Mpa.

C. Materials:

1. Hangers, Rods, Channels, Attachments, And Inserts
 - a. Galvanized and UL approved for service intended.
 - b. Support horizontal piping from clevis hangers or on roller assemblies with channel supports, except where trapeze type hangers are explicitly shown on Drawings. Hangers shall have double nuts.
 - c. Class Two Quality Standards:
 - 1) Support insulated pipes with clevis hanger equal to Anvil Fig 260 or roller assembly equal to Anvil Fig 171 with an insulation protection shield equal to Anvil Fig 167. Gauge and length of shield shall be in accordance with Anvil design data.
 - 2) Except uninsulated copper pipes, support uninsulated pipes from clevis hanger equal to Anvil Fig 260. Support uninsulated copper pipe from hanger equal to Anvil Fig CT-65 copper plated hangers and otherwise fully suitable for use with copper tubing.
 - d. Riser Clamps For Vertical Piping:
 - 1) Class Two Quality Standard: Anvil Figure 261.
 - e. Steel Deck Bracket:
 - 1) 6 inch length minimum.
 - 2) Class One Quality Standard: Unistrut P1000 with clamp nut.
 - 3) Acceptable Manufacturers: Hilti, Thomas & Betts
 - 4) Equal as approved by Architect before installation. See Section 01 6200.
 - f. Furnace / Fan Coil Support Channel:
 - 1) Class One Quality Standard: Unistrut P1000.
 - 2) Acceptable Manufacturers: Hilti, Thomas & Betts
 - 3) Equal as approved by Architect before installation. See Section 01 6200.
 - g. Swivel Attachment:
 - 1) Class One Quality Standard: Unistrut EM3127.
 - 2) Acceptable Manufacturers: Hilti, Thomas & Betts
 - 3) Equal as approved by Architect before installation. See Section 01 6200.

EXECUTION

2.2 INSTALLATION

- A. Interface With Other Work:
 1. Furnish inserts for attaching hangers that are to be cast in concrete floor construction to Division 03 at time floors are poured.
- B. Piping:
 1. Properly support piping and make adequate provisions for expansion, contraction, slope, and anchorage.
 - a. Except for underground pipe, suspend piping from roof trusses or clamp to vertical walls using support channels and clamps. Do not hang pipe from other pipe, equipment, or ductwork. Laying of piping on any building element is not allowed.
 - b. Supports For Horizontal Piping:

- 1) Support metal piping at **96 inches 2 400 mm** on center maximum for pipe **1-1/4 inches 31 mm** or larger and **72 inches 1 800 mm** on center maximum for pipe **1-1/8 inch 28 mm** or less.
- 2) Support thermoplastic pipe at **48 inches 1 200 mm** on center maximum.
- 3) Provide support at each elbow. Install additional support as required.
- c. Supports for Vertical Piping:
 - 1) Place riser clamps at each floor or ceiling level.
 - 2) Securely support clamps by structural members, which in turn are supported directly from building structure.
 - 3) Provide clamps as necessary to brace pipe to wall.
- d. Attach support channel to structural steel roof supporting structure. Spacing and support as described above.
- e. Insulate hangers for copper pipe from piping by means of at least two layers of Scotch 33 plastic tape.
- f. Expansion of Thermoplastic Pipe:
 - 1) Provide for expansion in every **30 feet 9 meters** of straight run.
 - 2) Provide **12 inch 300 mm** offset below roof line in each vent line penetrating roof.

END OF SECTION

SECTION 23 05 48**VIBRATION AND SEISMIC CONTROL FOR HVAC PIPING AND EQUIPMENT****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Quality of and requirements for anchorage and seismic restraint systems and vibration isolation systems for HVAC piping and equipment.
- B. Related Requirements:
 - 1. Section 03 3111: Cast-In-Place Concrete.
 - 2. Furnishing and installing of seismic restraint and vibration isolation systems is by installer of equipment requiring such systems. Manufacturers of equipment specified for seismic restraint shall provide product data needed for calculation of seismic restraint needs. This information shall include, but not be limited to, equipment dimensions, dimensioned anchor points, operating weight, and center of gravity dimension.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM A 615-05a, 'Standard Specification for Deformed & Plain Carbon Steel Bars for Concrete Reinforcement.'
 - 2. Sheet Metal & Air Conditioning Contractors National Association / American National Standards Institute:
 - a. SMACNA / ANSI 001-2000, 'Seismic Restraint Manual: Guidelines For Mechanical Systems.'

1.3 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Restraint system and anchorage method to be used for each piece of equipment.
 - b. Seismic restraints and calculations for all flexible mounted equipment.
 - c. Vibration isolators and flexible couplings.
 - d. Clearly outlined procedures for installing and adjusting isolators, seismic bracing anchors, and snubbers.
 - 2. Shop Drawings:
 - a. Show size, hanger length, and location of seismic restraints for piping and ductwork.
 - b. Show details for each isolator and seismic brace with snubbers proposed for specified equipment.
 - c. Show details for proposed structural steel frames and rails and for anchors to be used in conjunction with isolation of equipment.
 - d. Show locations of piping and ductwork restraints on installation and fabrication floor plans (not bid set of documents of floor plans), noting size and type of restraint to be used.
 - e. Show details of supports, hangers, anchorage, and bracing for isolated equipment as designed or proposed by professional engineer employed by Restraint Manufacturer and qualified with seismic experience in bracing for mechanical equipment. Shop drawings submitted for seismic bracing and anchors shall bear engineer's signed professional seal.
 - f. Include anchor bolt calculations, signed and stamped by registered engineer, showing adequacy of bolt sizing and type.

- 1) Calculations shall include anchor embedment, minimum edge distance and minimum center distance.
- 2) Design lateral forces shall be distributed in proportion to mass distribution of equipment.
- 3) Furnish calculations for anchors on restraint devices, cable, isolators, and on rigidly mounted equipment.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: System design and installation shall meet seismic requirements as defined in 2000 Edition of International Building Code and applicable state and local codes in accordance with minimum restraint capability of 1.0 g.
- B. Seismic Requirements: Mechanical equipment, piping, and ductwork shall be braced, snubbed, or supported to withstand seismic disturbances and remain operational.
- C. Vibration Isolation Requirements: Isolate equipment from structure by means of resilient vibration and noise isolators.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

- A. Manufacturers:
 1. Type One Acceptable Manufacturers:
 - a. Amber / Booth Company, Houston, TX www.amberbooth.com.
 - b. Mason Industries Inc, Hauppauge, NY www.mason-ind.com.
 - c. Vibration Mountings and Control Inc, Bloomington, NJ (201) 838-1780.
 - d. Equal as approved by Architect before bidding. See Section 01 6200.
- B. Performance:
 1. Design Criteria:
 - a. Isolation And Seismic Equipment:
 - 1) Piping: Restrain piping in accordance with Figures 4.11 to 4.19 in SMACNA Manual.
 - 2) Equipment with Fixed Anchor or Support:
 - a) Restraint designed according to Sections 1621 and 1622 of International Building Code.
 - b) Horizontal force factor for elements of structures:
 - (1) In addition, vertical force restraint requirement shall be computed at 1/2 value of horizontal forces.
 - (2) Restrain equipment not anchored directly to floors by cable system designed and furnished by Restraint Manufacturer.
 - 3) Ductwork: Restrain ductwork in accordance with Figures 4.2 to 4.10 in SMACNA Manual as appropriate.
 - b. Vibration Isolation Requirements:
 - 1) Unless otherwise noted, isolate HVAC equipment one horsepower and over from structure by means of resilient vibration and noise isolators in accordance with ASHRAE HANDBOOK 2003 - HVAC Applications, Table 42, Chapter 47.
 - 2) Design and install isolation equipment, hangers, connections, and other isolating devices to prevent transmission of vibration to structure from equipment and associated piping and ductwork.
 - 3) For floor-mounted equipment, use recommendations of Table 42.
 - 4) For roofs and floors constructed with open web joints, thin long span slabs, wooden construction and unusual light weight construction, evaluate equipment weighing more than 300 pounds to determine additional deflection of structure caused by equipment weight. Isolator deflection shall be 15 times additional deflection or deflection shown in Table 42, whichever is greater.

- 5) Under-Equipment Spring Isolators:
 - a) Equal to Mason SSLFH earthquake motion restrained spring mounts with freestanding stable steel springs, leveling bolts, corrosion resistant finish, motion limiting design, uplift restraining bolts, and 1/4 inch ribbed neoprene noise stop pad.
 - b) Isolators shall accept force in any direction up to 1.0 g without failure, and shall limit movement to 3/4 inch 19 mm in any direction.
 - c) Springs shall have 50 percent overload capacity.
 - d) Size as required to achieve specified static deflection.
 - e) Outer diameter of spring proper shall not be less than 0.8 of spring height when in loaded position.
 - 6) Overhead Support Spring And Rubber Hangers:
 - a) Combination spring and neoprene hangers.
 - b) Hanger bracket shall have 500 percent overload capability and shall allow up to 15 degree hanger rod misalignment without short-circuiting.
 - c) Springs shall have 50 percent overload capacity.
 - d) Provide seismic bracing as required.
 - 7) Isolate piping and ductwork in mechanical equipment room and piping and ductwork three supports away or 50 feet from other mechanical equipment, whichever is greater, from structure by means of vibration and noise isolators.
 - a) Isolate suspended piping with combination spring and fiberglass hangers in supporting rods.
 - b) Support floor-mounted piping directly on spring mounts.
 - 8) Isolate vertical pipe risers from structure using vibration and noise isolating expansion hangers having minimum rated deflection of four times anticipated pipe movement. Enclose in housing for fail-safe equipment.
 - 9) Incorporate flexible connectors in piping adjacent to reciprocating equipment.
 - 10) Incorporate flexible connections in ductwork adjacent to air-moving units.
 - 11) Elastomeric Isolator: Neoprene or high quality synthetic rubber with anti-ozone and anti-oxidant additives.
 - 12) Nuts, Bolts, And Washers: Electroplated zinc.
 - 13) Isolators Exposed To Weather: Cadmium plated and neoprene coated springs.
 - c. Seismic restraint equipment and resilient isolation devices shall be designed and furnished by single Manufacturer:
- C. Finishes:
1. Clean and paint steel components. Thoroughly clean structural steel bases of welding slag and prime with zinc-chromate or metal etching primer. Etch and paint hot dipped galvanized steel components.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Isolation Equipment:
1. Mount vibration isolated equipment on rigid steel frames or concrete bases unless Equipment Manufacturer certifies direct attachment capability.
 2. Install snubbers with factory set clearances.
 3. Piping:
 - a. Protect isolated and non-isolated piping 2-1/2 inches 63 mm inside diameter and larger in all planes by restraints to accommodate thermal movement as well as restrain seismic motions.
 - b. Locations shall be as scheduled and include, but not be limited to:
 - 1) At drops to equipment and at flexible connections.
 - 2) At 45 degree or greater changes in direction of pipe.
 - 3) At horizontal runs of pipe 30 feet 9 000 mm maximum on center spacing.
 - 4) Gas piping shall have additional restraints as scheduled.
 4. Ductwork:

- a. Protect isolated and non-isolated rectangular ductwork 4 sq ft in cross-sectional area and larger in all planes by restraints to accommodate thermal movement as well as restrain seismic motion.
 - b. Locations shall be determined by Seismic Restraint Manufacturer and include, but not be limited to:
 - 1) Horizontal runs of ductwork 30 feet 9 000 mm maximum on center spacing.
 - 2) 45 degree or greater changes in direction of ductwork.
 - 3) Each end of duct runs and drops of equipment.
 - 4) Each flexible connection.
- B. Vibration Isolation: Install piping and ductwork to prevent transmission of noise and vibration into structure.

END OF SECTION

SECTION 23 0553**IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install identification of HVAC equipment and piping as described in Contract Documents.

PART 2 - PRODUCTS**2.1 SYSTEMS**

- A. Description:
 - 1. Abbreviations for Pipe Stencils and Equipment Identification and Band Colors for Pipe Identification:
 - a. Apply stenciled symbols and continuous painting as follows:

Pipe Type	Pipe Color	Symbol
Gas	Yellow	GAS
 - b. Apply stenciled symbols and color banding as follows. Extend color band **2 inches 50 mm** minimum beyond each side of stenciled symbols.

Pipe Type	Band Color	Symbol
Steam Lines	Orange	STM
Steam Condensate Return	Lt Orange	COND
Hot Water Heating	Green	HWH
Chilled Water	Blue	CHW
- B. Materials:
 - 1. Paint:
 - a. Paints specified are from Pittsburgh Paint & Glass (PPG), Pittsburgh, PA www.ppgaf.com.
 - b. One Coat Primer:
 - 1) 6-2 Quick Drying Latex Primer Sealer over fabric covers.
 - 2) 6-205 Metal Primer under dark color paint.
 - 3) 6-6 Metal Primer under light color paint.
 - c. Finish Coats: Two coats 53 Line Acrylic Enamel.
 - d. Class Two Quality Standard. See Section 01 6200.
 - 1) Paint of equal quality from other Manufacturers may be used. Maintain specified colors, shades, and contrasts.
 - 2. Labels:
 - a. Equipment Identification: Black formica, with white reveal when engraved. Lettering to be **3/16 inch 5 mm** high minimum.

PART 3 - EXECUTION**3.1 APPLICATION**

- A. Labels:
 - 1. Identify following items with specified labels fastened to equipment with screws:
 - a. Thermostats and control panels in mechanical spaces.

- b. Furnaces.
 - c. Condensing units.
 - d. Air handling units and fan coil units.
 - e. Evaporative Cooling Units.
 - f. Accessible exhaust fans.
 - 2. Identify following items with specified labels fastened to equipment with screws:
 - a. Thermostats and control panels in mechanical spaces.
 - b. Accessible exhaust fans.
 - 3. Engrave following data from Equipment Schedules on Drawings onto labels:
 - a. Equipment mark.
 - b. Area served.
 - c. Thermostat zone number, when different from equipment mark.
 - d. Panel and breaker from which unit is powered.
- B. Painting:
- 1. Leave equipment in like-new appearance.
 - 2. Only painted legends, directional arrows, and color bands are acceptable.
 - 3. Locate identifying legends, directional arrows, and color bands at following points on exposed piping of each piping system:
 - a. Adjacent to each item of equipment.
 - b. At point of entry and exit where piping goes through wall.
 - c. On each riser and junction.
 - d. Every **25 feet** **7500 mm** on long continuous lines.
 - e. Stenciled symbols shall be one inch high and black.

END OF SECTION

SECTION 23 07 16**DUCT INSULATION****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install thermal wrap duct insulation as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 23 31 14: Low-Pressure Metal Ducts.
 - 2. Section 23 33 00: Acoustic duct liner.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturer Contact List:
 - 1. Certainteed St Gobain, Valley Forge, PA www.certainteed.com.
 - 2. Johns-Manville, Denver, CO www.jm.com.
 - 3. Knauf Fiber Glass, Shelbyville, IN www.knauffiberglass.com.
 - 4. Manson Insulation Inc, Brossard, QB www.isolationmanson.com.
 - 5. Owens-Corning, Toledo, OH www.owenscorning.com.

2.2 MATERIALS

- A. Thermal Wrap Duct Insulation:
 - 1. 1-1/2 inch 38 mm thick fiberglass with factory-laminated, reinforced aluminum foil scrim kraft facing and density of one lb/ per cu ft.
 - 2. Thermal Conductivity: 0.27 BTU in/HR SF deg F at 75 deg F 24 deg C maximum.
 - 3. Type One Acceptable Products:
 - a. Type 100 standard duct insulation by Certainteed St Gobain.
 - b. Microlite FSK by Johns-Manville.
 - c. Duct Wrap FSK by Knauf Fiber Glass.
 - d. Alley Wrap FSK by Manson Insulation Inc.
 - e. FRK by Owens-Corning.
 - f. Equal as approved by Architect before bidding. See Section 01 6200.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Thermal Wrap Duct Insulation:
 - 1. Install insulation as follows:
 - a. On outside air ducts and combustion air ducts within building insulation envelope.
 - b. On other air ducts where indicated on Drawings.
 - 2. Wrap insulation tightly on ductwork with circumferential joints butted and longitudinal joints overlapped minimum 2 inches 50 mm.

- a. Do not compress insulation except in areas of structural interference. Minimum thickness at corners shall be **one inch 25 mm** thick.
 - b. Remove insulation from lap before stapling.
 - c. Staple seams at approximately **16 inches 400 mm** on center with outward clenching staples.
 - d. Seal seams with foil vapor barrier tape or vapor barrier mastic. Seal penetrations of facing to provide vapor tight system.
- B. Insulate outside of ceiling diffusers, diffuser drops, and duct silencers same as ductwork.

END OF SECTION

SECTION 23 07 19**HVAC PIPING INSULATION****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
1. Furnish and install insulation on above ground refrigerant piping and fittings as described in Contract Documents.
 2. Furnish and install insulation for hot water heating and return piping system as described in Contract Documents.
 3. Furnish and install insulation for steam and condensate piping system as described in Contract Documents.
- B. Related Requirements:
1. Section 23 05 01: General Mechanical Requirements.

1.2 DELIVERY, STORAGE, AND HANDLING

- A. Keep materials and work dry and free from damage.
- B. Replace wet or damaged materials at no additional cost to Owner.

PART 2 - PRODUCTS**2.1 ASSEMBLIES**

- A. Manufacturers:
1. Manufacturer Contact List:
 - a. Armacell, Mebane, NC www.armacell.com.
 - b. Childers Products Co, Eastlake, OH www.fosterproducts.com.
 - c. Foster Products Corp, Oakdale, MN www.fosterproducts.com.
 - d. Johns-Manville, Denver, CO www.jm.com.
 - e. Knauf, Shelbyville, IN www.knauffiberglass.com.
 - f. Manson, Brossard, BC, Canada www.isolationmanson.com.
 - g. Nitron Industries, Thousand Oaks, CA www.nitronindustries.com.
 - h. Owens-Corning, Toledo, OH www.owenscorning.com.
 - i. Ramco, Lawrenceville, NJ www.ramco.com.
 - j. Nomac, Zebulon, NC www.nomaco.com.
 - k. Speedline Corp, Solon, OH www.speedlinepvc.com.

- B. Materials:
1. Refrigeration Piping System:
 - a. Thickness:

Pipe Size, Outside Diameter	Insulation Thickness
One inch and smaller	1/2 Inch
1-1/8 to 2 inch	3/4 Inch
2-1/8 inches and larger	One inch or two layers of 1/2 inch

Pipe Size, Outside Diameter	Insulation Thickness
25 mm and smaller	13 mm
29 to 50 mm	19 mm

54 mm and larger	25 mm or two layers of 13 mm
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- 1) **One inch 25 mm** sheet for fittings as recommended by Manufacturer.
- 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) AP Armaflex 25/50 by Armacell.
 - b) Nitrolite by Nitron Industries. White only for exterior.
 - c) Nomaco K-Flex.
- b. Joint Sealer:
 - 1) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Armacell 520 by Armacell.
 - b) Namaco K-Flex R-373.
- c. Insulation Tape:
 - 1) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Armaflex AP Insul Tape by Armacell.
 - b) FT182 Tape by Nitron Industries.
 - c) Elastomeric Foamtape by Nomac K-Flex.
- d. Exterior Finish:
 - 1) For application to non-white, exterior insulation.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) WB Armaflex Finish by Armacell.
 - b) R-374 Protective Coating by Nomaco K-Flex.
2. Hot-Water-Heat Piping Systems:
 - a. Piping Insulation:
 - 1) Heavy density fiberglass with fire retardant vapor barrier jacket with self-sealing laps. Thickness shall be **1-1/2 inches 39 mm** on heating supply and return lines.
 - 2) Performance Standard: Fiberglass heavy density with ASJ-SSL jacket by Owens-Corning.
 - 3) Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
 - a) Manson.
 - b) Johns Manville.
 - c) Owens-Corning.
 - b. Vapor Barrier Adhesive: As recommended by Insulation Manufacturer.
 - c. Covers For Valves And Fittings:
 - 1) Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
 - a) Zeston by Johns Manville.
 - b) Speedline.
 - d. Shields: **22 ga 0.8 mm** by **12 inch 300 mm** long galvanized steel.
 - e. Hydraulic Setting Insulating Cement.
 - 1) Class Two Quality Standard: Ramco Finishing Cement 1200.
 - f. Weather Barrier Mastic:
 - 1) Water based vinyl-acrylic mastic coating.
 - 2) Class Two Quality Standard: Childers / Foster CP-10 / CP-11.
 - g. Canvas: **4 oz 68 g**
3. Steam-Heat Piping System:
 - a. Fiberglass with integral vapor barrier jacket designed for use on steam systems.
 - b. Insulation Thickness: For piping exposed to outdoor air, increase thickness by **1/2 inch 50 mm**.

Piping System Types	Temperature Range, Deg F	Insulation Thickness for Size of Pipe		
		One to 2 Inches	2-1/2 to 4 Inches	5 Inches and Larger
Steam	306 to 450	1-1/2 Inches	2 Inches	3-1/2 Inches
Steam Condensate	Any	One Inch	1-1/2 Inches	2 Inches

Piping System Types	Temperature Range, Deg C	Insulation Thickness for Size of Pipe		
		25 to 50 mm	63 to 100 mm	125 mm and Larger
Steam	150 to 232	38 mm	50 mm	88 mm
Steam Condensate	Any	25 mm	38 mm	50 mm

- c. For piping exposed to outdoor air, increase thickness by **1/2 inch 50 mm**.

- d. Vapor Barrier Adhesive: As recommended by Insulation Manufacturer.
- e. Hydraulic Insulating Cement:
 - 1) Class Two Quality Standard. See Section 01 6200.
 - a) Ramco Finishing Cement 1200.
- f. Weather Barrier Mastic:
 - 1) Water based vinyl-acrylic mastic coating.
 - 2) Class Two Quality Standard. See Section 01 6200.
 - a) Childers / Foster CP-10 / CP-11.
- g. PVC jacket.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before application of insulating materials, brush clean surfaces to be insulated and make free from rust, scale, grease, dirt, moisture, and any other deleterious materials.
- B. Use drop cloths over equipment and structure to prevent adhesives and other materials spotting the work.

3.2 INSTALLATION

- A. Refrigeration System Piping System:
 - 1. General:
 - a. Install insulation in snug contact with pipe.
 - 1) Insulate flexible pipe connectors.
 - 2) Insulate thermal expansion valves with insulating tape.
 - 3) Insulate fittings with sheet insulation and as recommended by Manufacturer.
 - b. Slip insulation on tubing before tubing sections and fittings are assembled keeping slitting of insulation to a minimum.
 - c. Do not install insulation on lines through clamp assembly of pipe support. Butt insulation up against sides of clamp assembly.
 - d. Stagger joints on layered insulation. Seal joints in insulation.
 - e. Install insulation exposed outside building so 'slit' joint seams are placed on bottom of pipe.
 - f. Paint exterior exposed, non*white insulation with two coats of specified exterior finish.
 - 2. System Requirements:
 - a. Condensing Units: Install insulation on above ground refrigerant suction piping and fittings, including thermal bulb, from thermal expansion valve.
 - b. Split System Heat Pump Units: Install insulation on above ground refrigerant liquid and suction piping and fittings.
- B. Hot Water Heating System:
 - 1. Pipes:
 - a. Butt joints firmly together.
 - b. Seal vapor barrier longitudinal seam overlap with vapor barrier adhesive.
 - c. Wrap butt joints with 4 inch 100 mm strip of vapor barrier jacket material cemented with vapor barrier adhesive.
 - d. Finish with bands applied at mid-section and at each end of insulation.
 - 2. Valves And Fittings:
 - a. Insulate by one of following methods:
 - 1) With hydraulic setting insulating cement, or equal, to thickness equal to adjoining pipe insulation.
 - 2) With segments of molded pipe insulation securely wired in place.
 - b. Finish fittings and valves with canvas coated with weather barrier mastic or securely fitted Zeston covers.
 - 3. Pipe Hangers: Provide shields at each pipe hanger to protect pipe insulation from crushing.

3.3 FIELD QUALITY CONTROL

- A. Method of installing insulation shall be subject to approval of Architect. Sloppy or unworkmanlike installations are not acceptable.

3.4 CLEANING

- A. Leave premises thoroughly clean and free from insulating debris.

3.5 PROTECTION

- A. Protect insulation wherever leak from valve stem or other source might drip on insulated surface, with aluminum cover or shield rolled up at edges and sufficiently large in area and of shape that dripping will not splash on surrounding insulation.

END OF SECTION

SECTION 23 23 00**REFRIGERANT PIPING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install piping and specialties for refrigeration systems as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 23 05 01: Common HVAC Requirements.
 - 2. Section 23 07 19: Refrigerant Piping Insulation.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM A 36-05, 'Standard Specification for Carbon Structural Steel.'
 - b. ASTM B 280-05, 'Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.'
 - 2. American Welding Society / American National Standards Institute:
 - a. AWS / ANSI A5.8-2004, 'Specification for Brazing Filler Metal.'

1.3 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings: Show each individual equipment and piping support.
- B. Informational Submittals:
 - 1. Qualification Statements: Technician certificate for use of CFC and HCFC refrigerants.

1.4 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Installer: Refrigerant piping shall be installed by a refrigeration subcontractor licensed by State and by technicians certified in use of CFC and HCFC refrigerants.

PART 2 - PRODUCTS**2.1 COMPONENTS**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Emerson Climate Technologies, St Louis, MO www.emersonflowcontrols.com.
 - b. Cush-A-Clamp by ZSI Manufacturing, Canton, MI www.cushaclamp.com.
 - c. Elkhart Products Corp, Elkhart, IN www.elkhartproducts.com.
 - d. Handy & Harman Products Division, Fairfield, CT www.handy-1.com.
 - e. Harris Products Group, Cincinnati, OH www.harrisproductsgroup.com.
 - f. Henry Valve Co, Melrose Park, IL www.henrytech.com.

- g. Hilti Inc, Tulsa, OK www.hilti.com.
 - h. Hydra-Zorb Co, Auburn Hills, MI www.hydra-zorb.com.
 - i. Mueller Steam Specialty, St Pauls, NC www.muellersteam.com.
 - j. Nibco Inc, Elkhart, IN www.nibco.com.
 - k. Packless Industries, Waco, TX www.packless.com.
 - l. Parker Corp, Cleveland, OH www.parker.com.
 - m. Sporlan Valve Co, Washington, MO www.sporlan.com.
 - n. Sherwood Valves, Washington, PA www.sherwoodvalve.com.
 - o. Thomas & Betts, Memphis, TN www.superstrut.com.
 - p. Unistrut Corp, Wayne, MI www.unistrut.com.
 - q. Universal Metal Hose, Chicago, IL www.universalmetalhose.com.
 - r. Vibration Mountings & Controls, Bloomington, NJ www.vmc-kdc.com.
 - s. Virginia KMP Corp, Dallas, TX www.virginiakmp.com.
- B. Materials:
- 1. Refrigerant Piping:
 - a. Meet requirements of ASTM B 280, hard drawn straight lengths. Soft copper tubing not permitted.
 - b. Do not use pre-charged refrigerant lines.
 - 2. Refrigerant Fittings:
 - a. Wrought copper with long radius elbows.
 - b. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
 - 1) Mueller Streamline.
 - 2) Nibco Inc.
 - 3) Elkhart.
 - 3. Suction Line Traps:
 - a. Manufactured standard one-piece traps.
 - b. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
 - 1) Mueller Streamline.
 - 2) Nibco Inc.
 - 3) Elkhart.
 - 4. Connection Material:
 - a. Brazing Rods in accordance with ANSI / AWS A5.8:
 - 1) Copper to Copper Connections:
 - a) Classification BCuP-4 Copper Phosphorus (6 percent silver).
 - b) Classification BCuP-5 Copper Phosphorus (15 percent silver).
 - 2) Copper to Brass or Copper to Steel Connections: Classification BAg-5 Silver (45 percent silver).
 - 3) Do not use rods containing Cadmium.
 - b. Flux:
 - 1) Type Two Acceptable Products:
 - a) Stay-Silv White Brazing Flux by Harris Products Group.
 - b) High quality silver solder flux by Handy & Harmon.
 - c) Equal as approved by Architect before use. See Section 01 6200.
 - 5. Valves:
 - a. Expansion Valves:
 - 1) For pressure type distributors, externally equalized with stainless steel diaphragm, and same refrigerant in thermostatic elements as in system.
 - 2) Size valves to provide full rated capacity of cooling coil served. Coordinate selection with evaporator coil and condensing unit.
 - 3) Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
 - a) Emerson Climate Technologies.
 - b) Henry.
 - c) Mueller.
 - d) Parker.
 - e) Sporlan.
 - b. Manual Refrigerant Shut-Off Valves:
 - 1) Ball valves designed for refrigeration service and full line size.
 - 2) Valve shall have cap seals.

- 3) Valves with hand wheels are not acceptable.
- 4) Provide service valve on each liquid and suction line at compressor.
- 5) If service valves come as integral part of condensing unit, additional service valves shall not be required.
- 6) Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
 - a) Henry.
 - b) Mueller.
 - c) Sherwood.
 - d) Virginia.
6. Filter-Drier:
 - a. On lines 3/4 inch outside diameter and larger, filter-drier shall be replaceable core type with Schraeder type valve.
 - b. On lines smaller than 3/4 inch outside diameter, filter-drier shall be sealed type using flared copper fittings.
 - c. Size shall be full line size.
 - d. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
 - 1) Emerson Climate Technologies.
 - 2) Mueller.
 - 3) Parker.
 - 4) Sporlan.
 - 5) Virginia.
7. Sight Glass:
 - a. Combination moisture and liquid indicator with protection cap.
 - b. Sight glass shall be full line size.
 - c. Sight glass connections and sight glass body shall be solid copper or brass, no copper-coated steel sight glasses allowed.
 - d. Category Four Approved Product. See Section 01 6200 for definitions of Categories.
 - 1) HMI by Emerson Climate Technologies.
8. Flexible Connectors:
 - a. Designed for refrigerant service with bronze seamless corrugated hose and bronze braiding.
 - b. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Vibration Absorber Model VAF by Packless Industries.
 - 2) Vibration Absorbers by Virginia KMP Corp.
 - 3) Anaconda 'Vibration Eliminators' by Universal Metal Hose.
 - 4) Style 'BF' Spring-flex freon connectors by Vibration Mountings.
9. Refrigerant Piping Supports:
 - a. Base, Angles, And Uprights: Steel meeting requirements of ASTM A 36.
 - b. Securing Channels:
 - 1) At Free-Standing Pipe Support:
 - a) Class One Quality Standard: P-1000 channels by Unistrut.
 - b) Acceptable Manufacturers: Hilti, Thomas & Betts
 - c) Equal as approved by Architect before installation. See Section 01 6200.
 - 2) At Wall Support:
 - a) Class One Quality Standard: P-3300 channels by Unistrut.
 - b) Acceptable Manufacturers: Hilti, Thomas & Betts
 - c) Equal as approved by Architect before installation. See Section 01 6200.
 - 3) At Suspended Support:
 - a) Class One Quality Standard: P-1001 channels by Unistrut.
 - b) Acceptable Manufacturers: Hilti, Thomas & Betts
 - c) Equal as approved by Architect before installation. See Section 01 6200.
 - 4) Angle Fittings:
 - a) Class One Quality Standard: P-2626 90 degree angle by Unistrut.
 - b) Acceptable Manufacturers: Hilti, Thomas & Betts
 - c) Equal as approved by Architect before installation. See Section 01 6200.
 - c. Pipe Clamps:
 - 1) Type Two Acceptable Manufacturers:
 - a) Hydra-Zorb.
 - b) ZSI Cush-A-Clamp.
 - c) Hilti Cush-A-Clamp.

- d) Equal as approved by Architect before installation. See Section 01 6200.
- d. Protective Cover: 18 ga steel, hot-dipped galvanized.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refrigerant Lines:
 - 1. Install as high in upper mechanical areas as possible. Do not install underground or in tunnels.
 - 2. Slope suction lines down toward compressor **one inch/10 feet 25 mm in 3 meters**. Locate traps at vertical rises against flow in suction lines.
- B. Connections:
 - 1. Refrigeration system connections shall be copper-to-copper, copper-to-brass, or copper-to-steel type properly cleaned and brazed with specified rods. Use flux only where necessary. No soft solder (tin, lead, antimony) connections will be allowed in system.
 - 2. Braze manual refrigerant shut-off valve, sight glass, and flexible connections.
 - 3. Circulate dry nitrogen through tubes being brazed to eliminate formation of copper oxide during brazing operation.
- C. Specialties:
 - 1. Install valves and specialties in accessible locations. Install refrigeration distributors and suction outlet at same end of coil.
 - 2. Install thermostatic bulb as close to cooling coil as possible. Do not install on vertical lines.
 - 3. Install equalizing line in straight section of suction line, downstream of and reasonably close to thermostatic bulb. Do not install on vertical lines.
 - 4. Provide flexible connectors in each liquid line and suction line at both condensing unit and evaporator on systems larger than five tons. Anchor pipe near each flexible connector.
- D. Refrigerant Supports:
 - 1. Support Spacing:
 - a. Piping 1-1/4 inch And Larger: 8 feet on center maximum.
 - b. Piping 1-1/8 inch And Smaller: 6 feet on center maximum.
 - c. Support each elbow.
 - 2. Isolate pipe from supports and clamps with Hydrozorb or Cush-A-Clamp systems.
 - 3. Run protective cover continuous from condensing units to risers or penetrations at building wall.

3.2 FIELD QUALITY CONTROL

- A. Field Tests:
 - 1. Make evacuation and leak tests in presence of Architect's Engineer after completing refrigeration piping systems. Positive pressure test will not suffice for procedure outlined below.
 - a. Draw vacuum on each entire system with two stage vacuum pump. Draw vacuum to 300 microns using micron vacuum gauge capable of reading from atmosphere to 10 microns. Do not use cooling compressor to evacuate system nor operate it while system is under high vacuum.
 - b. Break vacuum with nitrogen and re-establish vacuum test. Vacuum shall hold for 30 minutes at 300 microns without vacuum pump running.
 - c. Conduct tests at 70 deg F ambient temperature minimum.
 - d. Do not run systems until above tests have been made and systems started up as specified. Inform Owner's Representative of status of systems at time of final inspection and schedule start-up and testing if prevented by outdoor conditions before this time.
 - e. After testing, fully charge system with refrigerant and conduct test with Halide Leak Detector.
 - f. Recover all refrigerant in accordance with applicable codes. Do not allow any refrigerant to escape to atmosphere.

2. If it is observed that refrigerant lines are being or have been brazed without proper circulation of nitrogen through lines, all refrigerant lines installed up to that point in time shall be removed and replaced at no additional cost to Owner.

END OF SECTION

SECTION 23 26 00**CONDENSATE DRAIN PIPING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install condensate drain piping as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 23 05 01: Common HVAC Requirements.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM B 88-03, 'Standard Specification for Seamless Copper Water Tube.'

PART 2 - PRODUCTS**2.1 SYSTEMS**

- A. Materials:
 - 1. Condensate Drains:
 - a. Exterior And Interior Lines: Type M copper meeting requirements of ASTM B 88.
 - b. Interior Lines Only: Schedule 40 PVC.
- B. Condensate Pump:
 - 1. Rated at 225 gph at 15 feet 4 500 mm total head. Complete with one gallon 3.8 liter polystyrene tank with pump and automatic float control. 1/5 hp, 120 V, one phase, 60 Hertz.
 - 2. Condensate piping shall be Type M copper or Schedule 40 PVC.
 - 3. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a. No. CB501UL by Beckett Corp, Irving, TX www.beckettumps.com.
 - b. No. VCL45ULS by Little Giant Pump Co, Oklahoma City, OK www.lgpc.com.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Condensate Drains:
 - 1. Support piping and protect from damage.
 - 2. Do not combine PVC condensate drain piping from furnace combustion chamber with copper condensate drain piping from cooling coil.

END OF SECTION

SECTION 23 30 01**COMMON DUCT REQUIREMENTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. General procedures and requirements for ductwork.
 - 2. Repair leaks in ductwork, as identified by duct testing, at no additional cost to Owner.
- B. Related Requirements:
 - 1. Section 01 43 16: Duct testing, adjusting, and balancing of ductwork.
 - 2. Section 07 92 19: Quality of acoustic sealant.
 - 3. Section 23 05 01: Common HVAC Requirements.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference: Schedule conference immediately before installation of ductwork.

1.3 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data: Specification data on sealer and gauze proposed for sealing ductwork.
 - 2. Samples: Sealer and gauze proposed for sealing ductwork.
- B. Informational Submittals:
 - 1. Manufacturer Instructions: Installation manuals providing detailed instructions on assembly, joint sealing, and system pressure testing for leaks.

PART 2 - PRODUCTS**2.1 ASSEMBLIES**

- A. Performance:
 - 1. Design Criteria:
 - a. Standard Ducts: Construction details not specifically called out in Contract Documents shall conform to applicable requirements of SMACNA HVAC Duct Construction Standards.
- B. Materials:
 - 1. Duct Hangers:
 - a. One inch 25 mm by 18 ga 1.27 mm galvanized steel straps or steel rods as shown on Drawings, and spaced not more than 96 inches 2 400 mm apart. Do not use wire hangers.
 - b. Attaching screws at trusses shall be 2 inch 50 mm No. 10 round head wood screws. Nails not allowed.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. During installation, protect open ends of ducts by covering with plastic sheet tied in place to prevent entrance of debris and dirt.
- B. Make necessary allowances and provisions in installation of sheet metal ducts for structural conditions of building. Revisions in layout and configuration may be allowed, with prior written approval of Architect. Maintain required airflows in suggesting revisions.
- C. Hangers And Supports:
 - 1. Install pair of hangers close to each transverse joint and elsewhere as required by spacing indicated in table on Drawings.
 - 2. Install upper ends of hanger securely to floor or roof construction above by method shown on Drawings.
 - 3. Attach strap hangers to ducts with cadmium-plated screws. Use of pop rivets or other means will not be accepted.
 - 4. Where hangers are secured to forms before concrete slabs are poured, cut off flush all nails, strap ends, and other projections after forms are removed.
 - 5. Secure vertical ducts passing through floors by extending bracing angles to rest firmly on floors without loose blocking or shimming. Support vertical ducts, which do not pass through floors, by using bands bolted to walls, columns, etc. Size, spacing, and method of attachment to vertical ducts shall be same as specified for hanger bands on horizontal ducts.

3.2 CLEANING

- A. Clean interior of duct systems before final completion.

END OF SECTION

SECTION 23 31 11**HIGH PRESSURE DUCTWORK****PART 1 - GENERAL****1.01 DESCRIPTION**

- A. This section specifies the construction of ductwork for the listed systems when the duct static pressure is greater than 2 inches W.C. Each duct system shall have a single pressure classification, which shall exceed to fan's external static rating listed in the equipment schedules. In cases where an external fan static is not given in the equipment schedules, the pressure classification of the duct system shall exceed the fan's total static rating.
- B. Provide ductwork and/or plenums for the following high pressure air systems:
 - 1. Supply air upstream of terminal boxes.
 - 2. Return air ductwork from air handling unit to combination fire smoke damper leaving shaft to serve the floor.
 - 3. .Return air/exhaust air ductwork upstream of air volume control devices.
- C. Include all turning vanes, volume dampers, duct access panels, wall and ceiling access panels, flexible connections, flexible duct, duct sealing systems, hangers and supports necessary to complete the indicated and specified system and achieve the desired system operation.

1.02 QUALITY ASSURANCE

- A. The listed standards are referenced for the contractor to follow for the construction of ductwork items not specifically addressed in this specification section. This specification takes precedence over the referenced standards.
- B. Standards:
 - 1. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), Sheet Metal and Air Conditioning Contractors National Association (SMACNA), National Fire Protection Association (NFPA), and Underwriters' Laboratories (UL).
 - 2. SMACNA "HVAC Duct Construction Standards Metal and Flexible" 1985 edition. Construct ductwork to meet all functional criteria defined in the 1985 SMACNA standards except where noted otherwise. Note: Duct constructions compliant with other editions of the SMACNA standards that do not meet or exceed the 1985 SMACNA standard are unacceptable.
 - 3. SMACNA "Round and Rectangular Industrial duct Construction Standards." This is to be used for return duct subject to negative pressures greater than 4 inches W.C. Construct ductwork to meet all functional criteria defined in the 1985 SMACNA standards except where noted otherwise. Note: Duct constructions compliant with other editions of the SMACNA standards that do not meet or exceed the 1985 SMACNA standard are unacceptable.
 - 4. SMACNA "HVAC Air Duct Leakage Test Manual" latest edition.
- C. All ductwork and fittings must have a computer generated label affixed to each section detailing all applicable information including the duct dimensions, gage, reinforcement type/class, and connector type of systems manufacturer. In addition, galvanizing thickness and country of origin must be clearly stenciled on each duct section.

- D. The Engineer reserves the right to randomly check sheet metal gauges and reinforcing to verify all duct construction is in compliance. Non-conforming material will be replaced by the Contractor at no cost to the Owner.

1.03 SUBMITTALS

- A. Submit ductwork fabrication and layout shop drawings in accordance with Section 20 05 15, "Submittals." Coordinate the detailed fabrication drawings with all trades. Coordinate size and location of ductwork with structure, piping, lighting, equipment, conduit, bus ducts, ceiling construction and clear height above ceilings and other items which may present a potential conflict.
- B. Layout drawings shall be at 1/4 inch = 1 foot scale on reproducible media with enlarged sections, elevations, plan drawings, and mechanical room drawings as necessary to ensure a coordinated installation.
- C. Written program outlining protection of ductwork from contamination with dirt and procedures for cleaning contaminated ductwork.
- D. Submit documentation that the minimum two weeks building 100% outside air flush-out was completed, including dates when the flush-out was begun and completed and what steps were taken to guarantee 100% outside air usage.
- E. Submit documentation for the filtration media used during the flush-out period, including filtration media manufacturer's name, model number, and MERV value.
- F. Submit documentation that all filtration was replaced immediately, prior to occupancy including filtration media manufacturer's name, model number, and MERV value.
- G. Low Emitting Materials Documentation:
 - 1. Provide a cut sheet and a Material Safety Data Sheet for each adhesive used in the building highlighting compliance with Specification requirements.
 - 2. Provide a cut sheet and a Material Safety Data Sheet for each sealant used in the building highlighting compliance with Specification requirements.

1.04 DUCT DIMENSIONS

- A. The dimensions indicated on the contract drawings are the net inside clear dimensions available for airflow.
- B. Contractor shall allow for exterior insulation thickness as required and indicate this on the ductwork layout shop drawings.

PART 2 PRODUCTS

2.01 STEEL DUCTWORK

- A. Unless noted otherwise, all ducts shall be constructed with G-90 or better galvanized steel conforming to ASTM A653/A653M and A924/A924M Standards, Lock-Forming Quality (LFQ). Provide a factory-applied surface protection such as oil or a paint-grip on all galvanized steel to be used for ductwork that will be painted.
- B. Stainless steel ductwork shall be Type 304 stainless steel with a No. 2D finish in concealed locations and a No. 4 finish for exposed locations, conforming to ASTM A-167 and A-480.

2.02 RECTANGULAR DUCT

- A. The following table indicates the minimum duct gauge based on largest dimension of the duct for fans with external static pressure over 2 inches W.G. up to 3 inches W.G. (Positive or Negative) - Return air ductwork from air handling unit to combination fire smoke damper leaving shaft to serve the floor.

DUCT DIMENSION	DUCT GAUGE WITHOUT REINFORCEMENT	DUCT GAUGE REINFORCED 4 FT ON CENTER	DUCT GAUGE REINFORCED 5 FT ON CENTER
12" or less	22	--	--
13" to 14"	20	24	24
15" to 18"	18	24	24
19" to 24"	16	24	24
25" to 26"	--	24	24
27" to 30"	--	24	22
31" to 36"	--	24	20
37" to 42"	--	22	20
43" to 48"	--	20	18
49" to 54"	--	18	18
55" to 60"	--	18	16
61" to 72"	--	16	--

1. Ducts with one dimension 73 inches to 120 inches shall be 18 gauge with reinforcement 2 feet on center. Reinforce all ducts having one dimension over 120 inches per SMACNA standards.
2. Duct reinforcement must be provided and spaced as indicated on all ducts with a dimension greater than 24 inches. All reinforcement shall meet SMACNA standards with regards to reinforcement style and rigidity. Reinforced ductwork gauges shall not be reduced from the minimums indicated in this specification. All reinforcement shall be galvanized steel.

- B. The following table indicates the minimum duct gauge based on largest dimension of the duct for fans with external static pressure up to 4 inches W.G. (Positive or Negative) - Ductwork from shaft combination fire smoke damper to terminal box.

DUCT DIMENSION	DUCT GAUGE WITHOUT REINFORCEMENT	DUCT GAUGE REINFORCED 4 FT ON CENTER	DUCT GAUGE REINFORCED 5 FT ON CENTER
10" or less	22	--	--
11" to 12"	20	24	24
13" to 16"	18	24	24
17" to 18"	16	24	24
19" to 22"	--	24	24
23" to 30"	--	24	22
31" to 36"	--	22	20
37" to 42"	--	20	18
43" to 48"	--	18	18
49" to 54"	--	18	16
55" to 60"	--	16	16

1. Ducts with one dimension 61 inches to 120 inches shall be 18 gauge with reinforcement 2 ft on center. Reinforce all ducts having one dimension over 120 inches per SMACNA standards.
2. Duct reinforcement must be provided and spaced as indicated on all ducts with a dimension greater than 18 inches. All reinforcement shall meet SMACNA standards with regards to reinforcement style

and rigidity. Reinforced ductwork gauges shall not be reduced from the minimums indicated in this specification. All reinforcement shall be galvanized steel.

- C. The following table indicates the minimum duct gauge based on largest dimension of the duct for fans with external static pressure over 4 inches W.G. up to 6 inches W.G. (Positive or Negative) - From air handling unit to combination fire smoke damper leaving shaft to serve floor.

DUCT DIMENSION	DUCT GAUGE WITHOUT REINFORCEMENT	DUCT GAUGE REINFORCED 4 FT ON CENTER	DUCT GAUGE REINFORCED 5 FT ON CENTER
8" or less	22	--	--
9" to 10"	20	24	24
11" to 14"	18	24	22
15" to 16"	16	24	22
17" to 22"	--	24	22
23" to 24"	--	22	22
25" to 28"	--	22	20
29" to 30"	--	22	18
31" to 36"	--	20	18
37" to 42"	--	18	16
43" to 48"	--	18	--
49" to 54"	--	16	--

1. Ducts with one dimension 55 inches to 120 inches shall be 18 gauge with reinforcement 2 ft on center. Reinforce all ducts having one dimension over 120 inches per SMACNA standards.
2. Duct reinforcement must be provided and spaced as indicated on all ducts with a dimension greater than 16 inches. All reinforcement shall meet SMACNA standards with regards to reinforcement style and rigidity. Reinforced ductwork gauges shall not be reduced from the minimums indicated in this specification classification. All reinforcements shall be galvanized steel.

2.03 ROUND DUCT

- A The following table indicates the minimum gauge for round supply ductwork for fans with external static pressure of up to 10 inches W.C.:

DUCT DIMENSION	SPIRAL SEAM GAUGE	LONGITUDINAL SEAM GAUGE	FITTING GAUGE
3" thru 14"	26	24	24
15" thru 26"	24	22	22
26" thru 36"	22	20	20
37 thru 50"	20	18	18
51 thru 60"	18	16	16
61" thru 84"	16	14	14

- B. The following table indicates the minimum gauge for round ductwork for fans with negative external static pressure of up to minus 4 inches W.C.:

DUCT DIMENSION	SPIRAL SEAM GAUGE	LONGITUDINAL SEAM GAUGE	FITTING GAUGE
3" thru 14"	24	22	24
15" thru 26"	22	18	22
26" thru 36"	20	20*	20*
37 thru 48"	18	18*	18*
49" thru 60"	18*	16*	16*

*. Provide reinforcement rings or equivalent, per SMACNA Standards.

C Additional round duct construction requirements:

1. Seam construction shall be spiral seam up to 60 inches in diameter and continuous butt weld above 60 inches in diameter.
2. All fittings are to be continuously welded construction.
3. Round elbows shall be radius type with a centerline radius of 1.5 times the duct diameter.
4. Provide round opposed multiblade volume dampers in round ducts.

2.04 FLAT OVAL DUCT

A. The following table indicates the minimum gauge for flat oval supply ductwork:

MAJOR DIMENSION	SPIRAL SEAM GAUGE	LONGITUDINAL SEAM GAUGE	FITTING GAUGE
3" to 24"	24	20	20
25" to 36"	22	20	20
37" to 48"	22	18	18
49" to 60"	20	18	18
61" to 70"	20	16	16
71" to 84"	18	16	16

1. Provide duct reinforcement and tie rods for flat sides of ducts as per SMACNA standards without reduction of duct gauge according to the following:

FAN EXTERNAL STATIC	MAJOR DIMENSION ABOVE WHICH SPIRAL REINFORCEMENT IS REQUIRED
Over 2" up to 3"	24"
Over 3" up to 4"	18"
Over 4" up to 6"	16"
Over 6"	12"

2. All fittings are to be continuously welded construction, or spot welded and bonded

2.05. DUCT SEALS

- A. Seal all duct transverse joints and longitudinal seams to meet SMACNA Seal Class A for 10 inches of static pressure as a minimum.

- B. Duct Sealant: Liquid seal for joints and seams. Surfaces are to be clean and free from oil, dust, dirt, rust, moisture, or any substance which would interfere with bonding of sealant. Where metal clearances exceed 1/16 inch, several applications are required.
 - 1. McGill AirSeal Corporation "United Duct Sealer – Water Based"
 - 2. Hardcast "Duct-Seal 321"
 - 3. Ductmate "Proseal"
 - 4. Products with documented VOC-emission rates meeting LEED guidelines by Dow Corning, Miracle Adhesives, Ductmate Industries, or Surebond, Inc.
- C. Soft elastomer butyl gasket with adhesive backing shall be used to seal flanged joints.

2.06 FIELD ERECTED CASING, PLENUMS AND MIXING BOXES

- A. Construct all casings and plenums to the pressure class equal to the fan's total pressure as indicated on the drawings. The casings shall be capable of handling both positive and negative pressures.
- B. Seal all pipe penetrations airtight. SECTION 23 31 11 HIGH PRESSURE DUCTWORK 13-HC1-033 23 31 11-7.
- C. Panel construction shall be galvanized steel.
- D. Drain pans shall be welded stainless steel and shall extend beyond the coil to catch all condensed water (extend a minimum of 6 inches beyond coil). For coils over 30 tall provide intermediate drain pans.
- E. Provide casing access doors with a minimum of two hinges and two latches. Provide access doors such that filters, dampers, motors, coils and control devices are accessible for service or removal. 1. Ventlock, Ruskin, or McGill AirPressure Corporation.
- F. Seal all joints, seams, penetrations, and connections on both suction and discharge sides of the fan in accordance with SMACNA Seal Class A for 10 inches of static pressure as a minimum. Provide gasketing on all doors and access panels.

2.07 FLEXIBLE DUCTWORK

- A. 5 feet is the maximum allowable length for connection to supply terminal boxes and laboratory air control supply terminals. Flexible ductwork shall not be used to connect return or exhaust air devices unless specifically indicated on Drawings.
- B. All flexible duct shall be UL-listed for use as flexible air ducts. Each flexible duct section shall be supported by a minimum of two (2) duct supports and shall not sag more 1/2 inch per linear foot of duct.
- C. In concealed and unconditioned spaces provide insulated flexible duct section with a double-ply polyester core or a heavy coated fiberglass cloth fabric core encapsulating a steel wire helix, and preventing all contact between the airstream and the insulating material. Minimum 12 inch W.C. working pressure from -20 degrees F to +250 degrees F, solid gray color. Flexmaster Type 3 or approved equal by other listed manufacturer.
- D. In exposed spaces provide uninsulated flexible duct section with a heavy coated fiberglass cloth fabric mechanically locked to encapsulate a steel wire helix. Minimum 12 inch W.C. working pressure from -20 degrees F to +250 degrees F, solid gray color. Flexmaster Type NI-45 or approved equal by other listed manufacturer.

- E. Manufacturers: Flexmaster, Hart & Cooley, or Thermaflex.

2.08 FLEXIBLE CONNECTIONS

- A. Flexible duct connector shall be used where ductwork connects to fans of apparatus, or apparatus casing to fans to isolate vibration transfer. Connectors shall be attached in such a manner as to provide an airtight and waterproof seal. Connectors will comply with NFPA 90A, "Installation of Air Conditioning & Ventilation Systems" and NFPA 90B, "Installation of Warm Air Heating & Air Conditioning Systems."
- B. Indoor installations shall be of a UL 214 listed, fire retardant Vinyl coated woven nylon or Neoprene coated woven fiberglass fabric. Minimum density of Vinyl is 20 ounces per square yard and rated to 200 degrees F. Minimum density of Neoprene is 30 ounces per square yard and rated to 200 degrees F.
- C. Outdoor installations shall be of a UL 214 listed UV-resistant Hypalon coated woven fiberglass fabric. Minimum density is 24 ounces per square yard and rated to 250 degrees F.

2.09 BLANK-OFF PANELS

- A. Provide 16 gauge, steel or aluminum, double skinned insulating blank-off panels behind louvers as indicated on the drawings. Material shall match louver material. Panel finish and color to match louver. Seal panel joints airtight. Provide panels with a minimum Rvalue of 6.

2.10 EXPOSED DUCTWORK

- A. All ductwork exposed in conditioned spaces shall be provided with a paint-grip galvanized finish or similar mill surface etch treatment for painting. Prime with Glidden #5229.
- B. On round ducts, provide pleated elbows.
- C. Take special care in applying duct sealants. Apply sealants at joints only in a neat and workman-like manner.

PART 3 EXECUTION

3.01 INSTALLATION

- A. All duct installations and duct construction shall comply with all requirements of this specification and meet or exceed SMACNA standards and recommendations for construction and installation.
- B. Provide turning vanes at all changes of direction supply and return ductwork.
- C. Seal all duct seams, joints, connections, and penetrations.
- D. Provide a minimum 6 inch flexible connection where ductwork connects to motor drive equipment. Do not bulge or install on a bind.
- E. Provide duct access doors at all fire dampers, smoke dampers, combination fire/smoke dampers, and motor-operated control dampers. Provide ceiling access panel in drywall or other inaccessible ceiling systems such that all such dampers are serviceable.

- F. Keep ductwork tight to underside of structure. Maintain at least 7 inches clear between duct and ceiling construction.
- G. Install all dampers and provide blank-off plate to seal frames airtight.
- H. Provide volume dampers as needed to balance system to airflow indicated on the drawings.
- I. Metallic flexible duct shall be attached with at least three (3) #8 sheet metal screws equally spaced around duct circumference, and five (5) #8 screws for ducts over 12 inches in diameter. Locate screws at least 1/2 inch from duct end.
- J. Non-Metallic flexible ducts shall be secured with a draw band. On ducts over 12 inches in diameter, position draw band behind a bead in the metal collar.
- K. Secure all insulation and vapor barriers on factory-fabricated flexible ducts with a separate draw band, independent of any used for the connection of the flexible duct to the duct collar.
- L. Provide duct access doors at all duct smoke detector locations. Coordinate locations with the Electrical Contractor.
- M. Galvanizing Repairs – Repair galvanizing damaged by welding, scratches, etc., using cold galvanizing compound.

3.02 TESTING

- A. Test Requirements:
 - 1. Installed ductwork shall be tested prior to installation of access doors, take-offs, etc.
 - 2. The Contractor shall give the Architect, Engineer, and Owner 72 hours notice prior to testing in order to provide an opportunity to witness the testing.
 - 3. Any testing conducted without prior notification providing an opportunity to witness the test shall be considered invalid and will be redone at the contractor's expense.
 - 4. Leak-test all ductwork. Air leakage in any tested section of ductwork shall not exceed that of SMACNA Leakage Class 6.
- B. Recommended Test Procedure: Perform testing in accordance with SMACNA HVAC Air Duct Leakage Test Manual and as follows below. Note that this reference establishes procedures only; and the allowable leakage rates are found in these Specifications.
 - 1. Use a certified orifice tube and its corresponding logarithmic chart for measuring the leakage. Supply fan must have a CFM capacity greater than the allowable leakage in CFM for the section being tested.
 - 2. Define section of system to be tested and blank off.
 - 3. Determine the percentage of the system being tested, on a square foot of surface area basis.
 - 4. Using the percentage determined in Step "3" and the maximum allowable leakage of 2% of the total system volume, determine the allowable leakage (cfm) for the section being tested.
 - 5. Pressurize to 100% of the duct pressure class design pressure and repair any significant or audible leaks.
 - 6. Pressurize again and measure leakage.
 - 7. Repeat Steps "5" and "6" until the leakage measured is less than the allowable defined in Step "4."
- D. Document all duct testing and submit testing results as part of "As-Built" documents. Furnish copies of all completed duct testing documentation upon request of the Architect, Engineer, or Owner.

3.03 DUCT CLEAN OUT

- A. Clean and blow out complete duct system before any connections to equipment are made. Inspect ductwork for debris before starting any fans.
- B. Interior surfaces shall be free of dust and debris prior to initial start up. Protect equipment which may be harmed by excessive dirt with filters, or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes. Any cleaning of duct systems shall comply with recommendations of NAIMA and NADCA.
- C. When internally cleaning duct work prior to installation or shipment to the jobsite, cover all duct ends and openings with a dual polyethylene protective film. Securely affix the film to protect against dirt and debris. Film must be translucent to facilitate inspection of interior surfaces without removing film. Film must have a minimum elongation of 600%, contain no VOC and leave no residue on duct after removal. Ductmate Industries "ProGuard" or approved equal.
- D. Clean external surfaces of foreign substances that might cause corrosion, deterioration of the metal, or where ductwork is to be painted.

3.04 CLEANLINESS REQUIREMENTS

- A. Construction Indoor Air Quality:
 - 1. Follow control measures of SMACNA IAQ Guidelines for Occupied Buildings Under Construction, Chapter 3, latest edition and as described below.
 - 2. Protect stored on-site or installed absorptive materials from moisture damage.
 - 3. Cap/seal supply, return, and exhaust air duct openings immediately after fabrication or cleaning. Schedule deliveries to the job site to match installation to avoid excessive storage at the job site. Store ductwork at the job site in closed trailers or in the immediate area in which it will be installed. Any ducts at the site that have any opening seals perforated are to be cleaned (if required). Maintain caps/seals on all openings of installed ducts. If openings of installed ducts have their seals perforated, clean contaminated duct sections. Demonstrate the cleanliness quality control to the Construction Manager. The duct cleanliness shall meet the advanced level of the SMACNA New Construction Guidelines.

END OF SECTION

SECTION 23 33 00**AIR DUCT ACCESSORIES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install duct accessories in specified ductwork as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 23 09 33: Temperature control damper actuators and actuator linkages.
 - 2. Section 23 30 01: Common Duct Requirements.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM C 1071-00, 'Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Acoustical Material).'
 - b. ASTM C 1338-00, 'Standard Test Method for Determining the Fungi Resistance of insulation Materials and Facings.'

PART 2 - PRODUCTS**2.1 ACCESSORY PRODUCTS**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. AGM Industries, Brockton, MA www.agmind.com.
 - b. Air Balance Inc, Holland, OH www.airbalance.com.
 - c. Air Filters Inc, Baltimore, MD www.afinc.com.
 - d. Air-Rite Manufacturing, Bountiful, UT (801) 295-2529.
 - e. American Warming & Ventilating, Holland, OH www.american-warming.com.
 - f. Arrow United Industries, Wyalusing, PA www.arrowunited.com.
 - g. Cain Manufacturing Company Inc, Pelham, AL www.cainmfg.com.
 - h. C & S Air Products, Fort Worth, TX www.csairproducts.com.
 - i. CertainTeed Corp, Valley Forge, PA www.certainteed.com.
 - j. Cesco Products, Florence, KY www.cescoproducts.com.
 - k. Daniel Manufacturing, Ogden, UT (801) 622-5924.
 - l. Design Polymerics, Fountain Valley, CA www.designpoly.com.
 - m. Duro Dyne, Bay Shore, NY www.durodyne.com.
 - n. Dyn Air Inc. Lachine, QB www.dynair.ca
 - o. Elgen Manufacturing Company, Inc. East Rutherford, NJ www.elgenmfg.com
 - p. Flexmaster USA Inc, Houston, TX www.flexmasterusa.com.
 - q. Greenheck Corp, Schofield, WI www.greenheck.com.
 - r. Gripnail Corp, East Providence, RI www.gripnail.com.
 - s. Hardcast Inc, Wylie, TX www.hardcast.com.
 - t. Honeywell Inc, Minneapolis, MN www.honeywell.com.
 - u. Industrial Acoustics Co, Bronx, NY www.industrialacoustics.com.
 - v. Johns-Manville, Denver, CO www.jm.com.
 - w. Kees Inc, Elkhart Lake, WI www.kees.com.
 - x. Knauf Fiber Glass, Shelbyville, IN www.knauffiberglass.com.

- y. Manson Insulation Inc, Brossard, QB www.isolationmanson.com.
- z. Metco Inc, Salt Lake City, UT (801) 467-1572.
- aa. Miracle / Kingco, Rockland, MA www.taccint.com.
- bb. Mon-Eco Industries Inc, East Brunswick, NJ www.mon-ecoindustries.com.
- cc. Nailor Industries Inc, Houston, TX www.nailor.com.
- dd. Owens Corning, Toledo, OH www.owenscorning.com.
- ee. Polymer Adhesive Sealant Systems Inc, Irving, TX www.polymeradhesives.com.
- ff. Pottorff Company, Fort Worth, TX www.pottorff.com.
- gg. Ruskin Manufacturing, Kansas City, MO www.ruskin.com.
- hh. Sheet Metal Connectors Inc, Minneapolis, MN www.smconnectors.com.
- ii. Techno Adhesive, Cincinnati, OH www.technoadhesives.com.
- jj. Titus, Richardson, TX (972) 699-1030. www.titus-hvac.com
- kk. McGill AirFlow, Groveport, OH www.mcgillairflow.com.
- ll. McGill AirSeal, Columbus, OH www.mcgillairseal.com.
- mm. Utemp Inc, Salt Lake City, UT (801) 978-9265.
- nn. Ventfabrics Inc, Chicago, IL www.ventfabrics.com.
- oo. Young Regulator Co, Cleveland, OH www.youngregulator.com.

B. Materials:

a. Adhesive:

- 1) Category Four Approved Water-Based Products. See Section 01 6200 for definitions of Categories.
 - a) Cain: Hydrotak.
 - b) Design Polymerics: DP2501 or DP2502 (CMCL-2501).
 - c) Duro Dyne: WSA.
 - d) Hardcast: Coil-Tack.
 - e) Miracle / Kingco: PF-101.
 - f) Mon-Eco: 22-67 or 22-76.
 - g) Polymer Adhesive: Glasstack #35.
 - h) Techno Adhesive: 133.
 - i) McGill Airseal: Uni-tack.
- 2) Category Four Approved Solvent-Based (non-flammable) Products. See Section 01 6200 for definitions of Categories.
 - a) Cain: Safetak.
 - b) Duro Dyne: FPG.
 - c) Hardcast: Glas-Grip 648-NFSE.
 - d) Miracle / Kingco: PF-91.
 - e) Mon-Eco: 22-24.
 - f) Polymer Adhesive: Q-Tack.
 - g) Techno Adhesive: 'Non-Flam' 106.
- 3) Category Four Approved Solvent-Based (flammable) Products. See Section 01 6200 for definitions of Categories.
 - a) Cain: HV200.
 - b) Duro Dyne: MPG.
 - c) Hardcast: Glas-Grip 636-SE.
 - d) Miracle / Kingco: PF-96.
 - e) Mon-Eco: 22-22.
 - f) Polymer Adhesive: R-Tack.
 - g) Techno Adhesive: 'Flammable' 106.

b. Fasteners:

- 1) Adhesively secured fasteners not allowed.
- 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) AGM Industries Inc: 'DynaPoint' Series RP-9 pin.
 - b) Cain.
 - c) Duro Dyne.
 - d) Gripnails may be used if each nail is installed by 'Grip Nail Air Hammer' or by 'Automatic Fastener Equipment' in accordance with Manufacturer's recommendations.

2. Flexible Equipment Connections:

- a. 30 oz closely woven UL approved glass fabric, double coated with neoprene.

- b. Fire retardant, waterproof, air-tight, resistant to acids and grease, and withstand constant temperatures of 250 deg F 121 deg C.
- c. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Cain: N-100.
 - 2) Duro Dyne: MFN.
 - 3) Elgen: ZLN.
 - 4) Ventfabrics: Ventglas.
 - 5) Ductmate: ProFlex.
- 3. Dampers And Damper Accessories:
 - a. Locking Quadrant Damper Regulators:
 - 1) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Duro Dyne: KS-38.
 - b) Ventfabrics: Ventline 555.
 - c) Young: No. 1.
 - b. Concealed Ceiling Damper Regulators:
 - 1) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Cain.
 - b) Duro Dyne.
 - c) Metco Inc.
 - d) Ventfabrics: 666 Ventlok.
 - e) Young: 301.
 - c. Volume Dampers:
 - 1) Rectangular Duct:
 - a) Factory-manufactured 16 ga 1.59 mm galvanized steel, single blade and opposed blade type with 3/8 inch 10 mm axles and end bearings. Blade width 8 inches 200 mm maximum. Blades shall have 1/8 inch 3 mm clearance all around.
 - b) Damper shall operate within acoustical duct liner.
 - c) Provide channel spacer equal to thickness of duct liner.
 - d) Dampers above removable ceiling and in Mechanical Rooms shall have locking quadrant on bottom or side of duct. Otherwise, furnish with concealed ceiling damper regulator and cover plate.
 - e) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) Air-Rite: Model CD-2.
 - (2) American Warming: VC-2-AA.
 - (3) Arrow: OBDAF-207.
 - (4) C & S: AC40.
 - (5) Cesco: AGO.
 - (6) Daniel: CD-OB.
 - (7) Greenheck: VCD-20.
 - (8) Pottorff: CD-42.
 - (9) Ruskin: MD-35.
 - (10) Utemp: CD-OB.
 - 2) Round Duct:
 - a) Factory-manufactured 20 ga 1.06 mm galvanized steel, single blade with 3/8 inch 10 mm axles and end bearings.
 - b) For use in outside air ducts.
 - c) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) Air Balance: Model AC-22.
 - (2) American Warming: V-22.
 - (3) Arrow: Type-70.
 - (4) C & S: AC21R.
 - (5) Cesco: MGG.
 - (6) Pottorff: CD-21R.
 - (7) Ruskin: MDRS-25.
 - d) Make provision for damper actuators and actuator linkages to be mounted external of air flow.
 - 3) Rectangular Ducts:
 - a) Damper Blades:

- (1) Steel or aluminum airfoil type with mechanically locked blade seals, 8 inch 200 mm blade width maximum measured perpendicular to axis of damper.
 - (2) Jamb seals shall be flexible metal compression type.
 - (3) Opposed or single blade type.
 - b) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) Air Balance: AC 526.
 - (2) American Warming: AC526.
 - (3) Arrow: AFD-20.
 - (4) C & S: AC50.
 - (5) Cesco: AGO3.
 - (6) Honeywell: D-643.
 - (7) Pottorff: CD-52.
 - (8) Ruskin: CD-60.
 - 4) Round Ducts:
 - a) Damper Blades:
 - (1) Steel with mechanically locked blade seals.
 - (2) Blade seals shall be neoprene or polyethylene.
 - (3) Single blade type.
 - b) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - (1) Air Balance: AC 25.
 - (2) American Warming: VC25.
 - (3) Arrow: Type 70 or 75.
 - (4) C & S: AC25R.
 - (5) Cesco: AGG.
 - (6) Honeywell: D-690.
 - (7) Pottorff: CD-25R.
 - (8) Ruskin: CD25
 - d. Backdraft Dampers:
 - 1) Backdraft blades shall be nonmetallic neoprene coated fiberglass type.
 - 2) Stop shall be galvanized steel screen or expanded metal, 1/2 inch 13 mm mesh.
 - 3) Frame shall be galvanized steel or extruded aluminum alloy.
 - 4) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Air-Rite: Model BDD-3.
 - b) American Warming: BD-15.
 - c) C & S: BD30.
 - d) Cesco: FBD 101.
 - e) Daniel: FBD-H/V.
 - f) Pottorff: 50FBD.
 - g) Ruskin: NMS2.
 - h) UTEMP: BFEA.
4. Duct Silencers:
 - a. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Air Filters Inc.: AIRSAN.
 - 2) Industrial Acoustic Co.
 - 3) Titus Products Div.
 - 4) McGill AirsealCorp.
5. Air Turns:
 - a. Single thickness vanes. Double thickness vanes not acceptable.
 - b. 4-1/2 inch 113 mm wide vane rail. Junior vane rail not acceptable.
6. Branch Tap for Flexible Ductwork:
 - a. Factory-manufactured rectangular-to-round 45 degree leading tap fabricated of 24 ga 0.635 mm zinc-coated lock-forming quality steel sheets meeting requirements of ASTM A 653, with G-90 coating.
 - b. One inch wide mounting flange with die formed corner clips, pre-punched mounting holes, and adhesive coated gasket.
 - c. Manual Volume Damper:
 - 1) Single blade, 22 ga 0.79 mm minimum
 - 2) 3/8 inch 10 mm minimum square rod with brass damper bearings at each end.

- 3) Heavy-duty locking quadrant on 1-1/2 inch 38 mm high stand-off mounting bracket attached to side of round duct.
 - d. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) ST-1HD by Air-Rite.
 - 2) STO by Flexmaster.
 - 3) HET by Sheet Metal Connectors.
- C. Fabrication:
- 1. Air Turns:
 - a. Permanently install vanes arranged to permit air to make abrupt turn without appreciable turbulence, in 90 degree elbows of above ground supply and return ductwork.
 - b. Quiet and free from vibration when system is in operation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Flexible Connections: Install flexible inlet and outlet duct connections to each furnace.
- B. Dampers And Damper Accessories:
 - 1. Install concealed ceiling damper regulators.
 - a. Paint cover plates to match ceiling tile.
 - b. Do not install damper regulators for dampers located directly above removable ceilings or in Mechanical Rooms.
 - 2. Provide each take-off with an adjustable volume damper to balance that branch.
 - a. Anchor dampers securely to duct.
 - b. Install dampers in main ducts within insulation.
 - c. Dampers in branch ducts shall fit against fiber glass duct walls, bottom and top of duct, and be securely fastened. Cut duct liner to allow damper to fit against fiber glass duct.
 - d. Where concealed ceiling damper regulators are installed, provide cover plate.

END OF SECTION

SECTION 23 33 46**FLEXIBLE DUCTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install supply air branch duct runouts to diffusers as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 23 30 01: Common Duct Requirements.

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Anco Products Inc, Elkhart, IN www.ancoproductsinc.com.
 - b. Thermaflex by Flexible Technologies, Abbeville, SC or Mississauga, ON www.thermaflex.net.
 - c. Flexmaster USA Inc, Houston, TX www.flexmasterusa.com or Flexmaster Canada Ltd, Richmond Hill, ON (905) 731-9411.
- B. Materials:
 - 1. Ducts:
 - a. Formable, flexible, circular duct which shall retain its cross-section, shape, rigidity, and shall not restrict airflow after bending.
 - b. Insulation: Nominal 1-1/2 inches 38 mm, 3/4 lb/cu ft density fiberglass insulation with air-tight, polyethylene or polyester core, sheathed in seamless vapor barrier jacket factory installed over flexible assembly.
 - c. Assembly, including insulation and vapor barrier, shall meet Class I requirement of NFPA 90A-1989 and be UL 181 rated, with flame spread of 25 or less and smoke developed rating of 50 or under.
 - d. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) ANCO-FLEX 4625 by Anco Products.
 - 2) M-KC by Thermaflex by Flexible Technologies.
 - 3) Type 4m Insulated by Flexmaster.
 - 2. Cinch Bands: Nylon, 3/8 inch 10 mm removable and reusable type.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Install duct in fully extended condition free of sags and kinks, using 72 inch 1 800 mm maximum lengths.
- B. Make duct connections by coating exterior of duct collar for 3 inches 75 mm with duct sealer and securing duct in place over sheet metal collar with specified cinch bands.

END OF SECTION

SECTION 23 34 00**HVAC FANS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install exhaust fans as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 23 3001: Common Duct Requirements.
 - 2. Division 26: Control device and electrical connection.

1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: Bear AMCA seal and UL label.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturer Contact List:
 - 1. Acme Engineering & Manufacturing Corp, Muskogee, OK www.acmefan.com.
 - 2. Breidert Air Products, Jacksonville, FL www.breidert.com.
 - 3. Carnes Co, Verona, MI www.carnes.com.
 - 4. Greenheck Corp, Schofield, WI www.greenheck.com.
 - 5. Loren Cook Co, Springfield, MO www.lorencook.com.
 - 6. PennBarry, Richardson, TX (215) 464-8900 www.pennbarry.com.

2.2 MANUFACTURED UNITS

- A. Ceiling Mounted Exhaust Fans:
 - 1. Acoustically insulated housings. Sound level rating of 4.6 sones maximum for fan RPM and CFM listed on Drawings.
 - 2. Include chatterproof integral back-draft damper with no metal-to-metal contact.
 - 3. True centrifugal wheels.
 - 4. Entire fan, motor, and wheel assembly shall be easily removable without disturbing housing.
 - 5. Suitably ground motors and mount on rubber-in shear vibration isolators.
 - 6. Provide wall or roof cap, as required.
 - 7. Class One Quality Standards:
 - a. Greenheck SP.
 - b. PennBarry Zephyr.
 - 8. Approved Manufacturers. See Section 01 6200.
 - a. Acme, Breidert, Broan, Carnes, Cook-Gemini, Greenheck, PennBarry.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Anchor fan units securely to structure or to curb.

END OF SECTION

SECTION 23 37 13**DIFFUSERS, REGISTERS, AND GRILLES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install diffusers, registers, and grilles connected to ductwork as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 23 3001: General Duct Requirements.

1.2 SUBMITTALS

- A. Maintenance Material Submittals:
 - 1. Tools: Leave tool for removing core of each different type of grille for building custodian.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturer Contact List:
 - 1. Carnes Co, Verona, MI www.carnes.com
 - 2. J & J Register, Grand Rapids, MI www.jandjreg.com.
 - 3. Krueger Air System Components, Richardson, TX www.krueger-hvac.com.
 - 4. Metal*Aire by Metal Industries Inc, Clearwater, FL www.metalaire.com.
 - 5. Nailor Industries Inc, Houston, TX www.nailor.com.
 - 6. Price Industries Inc, Suwanee, GA www.price-hvac.com.
 - 7. Titus, Richardson, TX www.titus-hvac.com.
 - 8. Tuttle & Bailey, Richardson, TX www.tuttleandbailey.com.

2.2 MANUFACTURED UNITS

- A. Supply Grilles And Registers:
 - 1. Finish: Off-white baked enamel.
 - 2. Removable core.
 - 3. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a. Carnes: RVEA.
 - b. J & J: 2815.
 - c. Krueger: 5815.
 - d. Metal*Aire: 42C.
 - e. Nailor: 51RCD.
 - f. Price: LBMR/DV1.
 - g. Titus: 1707.
 - h. Tuttle & Bailey: VF5.
- B. Ceiling Return And Transfer Grilles:
 - 1. Finish: Off-white baked enamel.
 - 2. 1/2 inch 13 mm spacing.
 - 3. Category Four Approved Products. See Section 01 6200 for definitions of Categories.

- a. Carnes: RSLA.
 - b. J & J: S90H.
 - c. Krueger: S85H.
 - d. Metal*Aire: SRH.
 - e. Nailor: 6155H.
 - f. Price: 535.
 - g. Titus: 355RL or 355 RS.
 - h. Tuttle & Bailey: T70D.
- C. High Side Wall Return Grilles:
- 1. Finish: Off-white baked enamel.
 - 2. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a. Carnes: RHEA.
 - b. J & J: 2810.
 - c. Metal*Aire: 41C.
 - d. Krueger: 5810.
 - e. Nailor: 51RC.
 - f. Price: LBMR.
 - g. Titus: 1700.
 - h. Tuttle & Bailey: VF.
- D. Floor / Toe Space Return Grilles:
- 1. Finish: Clear anodized.
 - 2. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a. Carnes: CCJB (with mitered corners welded on face and sanded).
 - b. J & J: 2500 with Frame 10.
 - c. Krueger: 1500F.
 - d. Metal*Aire: 2000F.
 - e. Nailor: 49-240-FN-MM.
 - f. Price: LBP-25B.
 - g. Titus: CT-540.
 - h. Tuttle & Bailey: LFD.
- E. Low Sidewall Return Grilles:
- 1. Finish: Off-white baked enamel.
 - 2. 38 or 45 degree deflection.
 - 3. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a. Carnes: RSHA.
 - b. J & J: S-590.
 - c. Krueger: S480H.
 - d. Metal*Aire: HD-RH.
 - e. Nailor: 6145H-HD.
 - f. Price: 90-L.
 - g. Titus: 33RL or 33RS.
 - h. Tuttle & Bailey: T110.
- F. Soffit Grilles:
- 1. Finish: Baked enamel. Match soffit color.
 - 2. Aluminum with aluminum mesh insect screen.
 - 3. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a. Carnes: RAAA.
 - b. J & J: ALS95H.
 - c. Krueger: S585H.
 - d. Metal*Aire: RHE.
 - e. Nailor: 5155-IS.
 - f. Price: 635.
 - g. Titus: 355FL.
 - h. Tuttle & Bailey: A70D-5.

G. Ceiling Diffusers:

Diffusers, Registers, And Grilles

1. Finish: Off-white baked enamel.
 2. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a. Carnes: SKSA.
 - b. J & J: R-1400.
 - c. Krueger: SH.
 - d. Metal*Aire: 5500S.
 - e. Nailor: 65OOB.
 - f. Price: SMD-6.
 - g. Titus: TDC-6.
 - h. Tuttle & Bailey: MS
- H. Ceiling Slot Diffusers:
1. Linear slot type with 180 deg adjustable air pattern and aluminum construction.
 2. Provide type 2B frame and end border at each end.
 3. Finish: Off-white baked enamel.
 4. Class One Quality Standard: Titus ML-39.
 5. Approved Manufacturers. See Section 01 6200.
 - a. Krueger, Metal*Aire, Titus.
- I. Door Grilles:
1. Finish: Baked enamel. Match door as closely as possible as approved by Architect.
 2. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a. Carnes.
 - b. J & J.
 - c. Krueger.
 - d. Metal*Aire.
 - e. Nailor: 61OGD.
 - f. Price: STGI-BF.
 - g. Titus: T-700.
 - h. Tuttle & Bailey.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Anchor securely into openings. Secure frames to ductwork by using four sheet metal screws, one per side. Level floor registers and anchor securely into floor.

3.2 ADJUSTING

- A. Set sidewall supply register blades at 15 degrees upward deflection.

END OF SECTION

SECTION 23 37 14**LOUVERS AND VENTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install louvers connected to ductwork as described in Contract Documents.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturer List:
 - 1. Airolite Co, Marietta, OH www.airolite.com.
 - 2. Air-Rite Manufacturing, Bountiful, UT (801) 295-2529.
 - 3. American Warming & Ventilating, Holland, OH www.awv.com.
 - 4. Arrow United Industries, Wyalusing, PA www.arrowunited.com.
 - 5. Carnes Co, Verona, WI www.carnes.com.
 - 6. Industrial Louvers Inc, Delano, MN www.industriallouvers.com.
 - 7. Ruskin Manufacturing, Kansas City, MO www.ruskin.com.
 - 8. Vent Products Co Inc, Chicago, IL www.ventprod.com.
 - 9. Wonder Metals Corp, Redding, CA www.wondermetals.com.

2.2 MANUFACTURED UNITS

- A. Louvers:
 - 1. General:
 - a. Extruded aluminum, with blades welded or screwed into frames.
 - b. Frames shall have mitered corners.
 - c. Louvers shall be recessed, flanged, stationary, or removable as noted on Drawings.
 - d. Finish:
 - 1) Polyvinylidene Fluoride (PVF₂) Resin-base finish (Kynar 500 or Hylar 5000) containing 70 percent minimum PVF₂ in resin portion of formula. Thermo-cured two coat system consisting of corrosion inhibiting epoxy primer and top coat factory applied over properly pre-treated metal.
 - 2) Color as selected by Architect from Manufacturer's standard colors.
- 2. Louvers Connected To Ductwork:
 - a. 1/2 inch 13 mm mesh 16 ga 1.59 mm aluminum bird screen.
 - b. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) K638 by Airolite.
 - 2) LE-1 by Air-Rite Manufacturing.
 - 3) LE48 by American Warming & Ventilating.
 - 4) EA-405 by Arrow United Industries.
 - 5) FKDA by Carnes.
 - 6) 455-XP by Industrial Louvers.
 - 7) ELF81S30 by Ruskin.
 - 8) 2740-31 by Vent Products.
 - 9) EX by Wonder Metals.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Anchor securely into openings.
- B. Where louvers touch masonry or dissimilar metals, protect with heavy coat of asphaltum paint.

END OF SECTION

DIVISION 26: ELECTRICAL

26 0000 ELECTRICAL

26 0501 COMMON ELECTRICAL REQUIREMENTS
26 0503 ELECTRICAL UTILITY SERVICES
26 0519 LINE-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 0523 CONTROL-VOLTAGE ELECTRICAL CABLES
26 0526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
26 0613 ELECTRICAL EQUIPMENT MOUNTING HEIGHT SCHEDULE

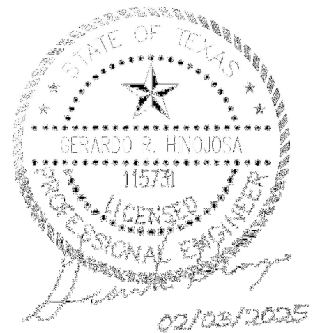
26 2000 LOW (LINE) VOLTAGE DISTRIBUTION

26 2417 CIRCUIT-BREAKER PANEL BOARDS
26 2726 WIRING DEVICES
26 2816 ENCLOSED SWITCHES AND CIRCUIT BREAKERS
26 2913 ENCLOSED CONTROLLERS

26 5000 LIGHTING

26 5100 INTERIOR LIGHTING
26 5200 EMERGENCY LIGHTING
26 5600 EXTERIOR LIGHTING

END OF TABLE OF CONTENTS



SECTION 26 05 01**COMMON ELECTRICAL REQUIREMENTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. General electrical system requirements and procedures.
 - 2. Perform excavating and backfilling work required by work of this Division as described in Contract Documents.
 - 3. Make electrical connections to equipment provided under other Sections.
 - 4. Furnish and install Penetration Firestop Systems at electrical system penetrations as described in Contract Documents.
- B. Products Furnished But Not Installed Under This Section:
 - 1. Anchor bolts and templates for exterior lighting equipment bases.
- C. Related Requirements:
 - 1. Section 07 8400: Quality of Penetration Firestop Systems to be used on Project and submittal requirements.
 - 2. Section 31 2316: Criteria for performance of excavating.
 - 3. Section 31 2323: Criteria for performance of backfilling.

1.2 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Provide following information for each item of equipment:
 - 1) Catalog Sheets.
 - 2) Assembly details or dimension drawings.
 - 3) Installation instructions.
 - 4) Manufacturer's name and catalog number.
 - 5) Name of local supplier.
 - b. Furnish such information for following equipment:
 - 1) Sections 26 2417 / 8: Panelboards.
 - 2) Section 26 2726: Wiring devices.
 - 3) Section 26 2774: Bell system.
 - 4) Section 26 2816: Enclosed switches and circuit breakers.
 - 5) Section 26 5100: Interior lighting fixtures.
 - 6) Section 26 5200: Emergency battery units.
 - c. Do not purchase equipment before approval of product data.
 - 2. Shop Drawings:
 - a. Submit on Panelboards.
 - b. Indicate precise equipment to be used, including all options specified. Indicate wording and format of nameplates where applicable. Submit in three-ring binder with hard cover.
- B. Informational Submittals:
 - 1. Test And Evaluation Reports: Report of site tests, before Substantial Completion.
- C. Closeout Submittals:
 - 1. Operations And Maintenance Manual Data:
 - a. Modify and add to requirements of Section 01 7000 as follows:

- 1) Provide operating and maintenance instructions for each item of equipment submitted under Product Data.

1.3 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 1. NEC and local ordinances and regulations shall govern unless more stringent requirements are specified.
 2. Material and equipment provided shall meet standards of NEMA or UL and bear their label wherever standards have been established and label service is available.

1.4 OWNER'S INSTRUCTIONS

- A. Provide competent instructor for three days to train maintenance personnel in operation and maintenance of electrical equipment and systems. Factory representatives shall assist this instruction as necessary. Schedule instruction period at time of final inspection.

1.5 SCHEDULING

- A. Include detailed sequence of individual electrical demolition operations on Construction Schedule specified in Section 01 3200.
- B. Coordinate with Owner for equipment and materials to be removed by Owner.

PART 2 - PRODUCTS

2.1 SYSTEMS

- A. Performance:
 1. Design Criteria:
 - a. Materials and equipment provided under following Sections shall be by same Manufacturer:
 - 1) Section 26 2417: Panelboards.
 - 2) Section 26 2816: Enclosed Switches And Circuit Breakers.
 - 3) Section 26 2913: Enclosed Controllers.

PART 3 - EXECUTION

3.1 INSTALLERS

- A. Approved Electrical Installers. See Section 01 4300 for definitions of Categories.

3.2 EXAMINATION

- A. All relocations, reconnections, and removals are not necessarily indicated on Drawings. Include such work without additional cost to Owner.
- B. Confirm dimensions, ratings, and specifications of equipment to be installed and coordinate these with site dimensions and with other Sections.

3.3 PREPARATION

- A. Disconnect equipment that is to be removed or relocated. Carefully remove, disassemble, or dismantle as required, and store in approved location on site, existing items to be reused in completed work.
- B. Where affected by demolition or new construction, relocate, extend, or repair raceways, conductors, outlets, and apparatus to allow continued use of electrical system. Use methods and materials as specified for new construction.
- C. Perform drilling, cutting, block-offs, and demolition work required for removal of necessary portions of electrical system. Do not cut joists, beams, girders, trusses, or columns without prior written permission from Architect.
- D. Remove concealed wiring abandoned due to demolition or new construction. Remove circuits, conduits, and conductors that are not to be re-used back to next active fixture, device, or junction box.
- E. Patch, repair, and finish surfaces affected by electrical demolition work, unless work is specifically specified to be performed under other Sections of the specifications.

3.4 INSTALLATION

- A. General:
 - 1. Locations of electrical equipment shown on Drawings are approximate only. Field verify actual locations for proper installation.
 - 2. Coordinate electrical equipment locations and conduit runs with those providing equipment to be served before installation or rough-in.
 - a. Notify Architect of conflicts before beginning work.
 - b. Coordinate locations of power and lighting outlets in mechanical rooms and other areas with mechanical equipment, piping, ductwork, cabinets, etc, so they will be readily accessible and functional.
 - 3. Work related to other trades which is required under this Division, such as cutting and patching, trenching, and backfilling, shall be performed according to standards specified in applicable Sections.
- B. Install Penetration Firestop System appropriate for penetration at electrical system penetrations through walls, ceilings, and top plates of walls.

3.5 FIELD QUALITY CONTROL

- A. Field Tests:
 - 1. Test systems and demonstrate equipment as working and operating properly. Notify Architect before test. Rectify defects at no additional cost to Owner.
 - 2. Measure current for each phase of each motor under actual final load operation, i.e. after air balance is completed for fan units, etc. Record this information along with full-load nameplate current rating and size of thermal overload unit installed for each motor.

3.6 CLEANING

- A. Remove obsolete raceways, conductors, apparatus, and lighting fixtures promptly from site and dispose of legally.

END OF SECTION

SECTION 26 05 03**ELECTRICAL UTILITY SERVICES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install service as described in Contract Documents and as required by local serving agency.
 - 2. Complete cost of service.
- B. Related Requirements:
 - 1. Section 03 3053: Transformer pad.
 - 2. Section 26 0501: Common Electrical Requirements.
 - 3. Local utility shall furnish and install primary underground service including transformer, conductors, current transformers, metering conductors, and meter.

PART 2 - PRODUCTS: Not Used**PART 3 - EXECUTION****3.1 INSTALLATION**

- A. Interface with Other Work: Coordinate with serving agency on all items, especially service entrance fittings, meter sockets, and current transformer (C/T) boxes where required.

END OF SECTION

SECTION 26 05 19**LINE-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Quality of conductors used on Project except as excluded below.
- B. Related Requirements:
 - 1. Section 23 0933: Conductors and cables for temperature control system.
 - 2. Section 26 0501: Common Electrical Requirements.

1.2 REFERENCES

- A. Definitions:
 - 1. Line Voltage: Over 70 Volts.

PART 2 - PRODUCTS**2.1 SYSTEMS**

- A. Line Voltage Conductors:
 - 1. Copper with AWG sizes as shown:
 - a. Minimum size shall be No. 12 except where specified otherwise.
 - b. Conductor size No. 8 and larger and wiring inside walk-in Cooler and Freezer shall be stranded.
 - 2. Insulation:
 - a. Standard Conductor Size No. 10 And Smaller: 600V type THWN or XHHW (75 deg C).
 - b. Standard Conductor Size No. 8 And Larger: 600V Type THW, THWN, or XHHW (75 deg C).
 - c. Higher temperature insulation as required by NEC or local codes.
 - 3. Colors:
 - a. 208Y / 120 V System:
 - 1) Black: Phase A.
 - 2) Red: Phase B.
 - 3) Blue: Phase C.
 - 4) Green: Ground.
 - 5) White: Neutral.
 - b. 480Y / 277 Volt System:
 - 1) Brown: Phase A.
 - 2) Orange: Phase B.
 - 3) Yellow: Phase C.
 - 4) Gray: Neutral.
 - 5) Green: Ground.
 - c. Conductors size No. 10 and smaller shall be colored full length. Tagging or other methods for coding of conductors size No. 10 and smaller not allowed.
 - d. For feeder conductors larger than No. 10 at pull boxes, gutters, and panels, use painted or taped band or color tag color-coded as specified above.
- B. Standard Connectors:
 - 1. Conductors No. 8 And Smaller: Steel spring wire connectors.
 - 2. Conductors Larger Than No. 8: Pressure type terminal lugs.

3. Connections Outside Building: Watertight steel spring wire connections with waterproof, non-hardening sealant.
- C. Terminal blocks for tapping conductors:
 1. Terminals shall be suitable for use with 75 deg C copper conductors.
 2. Acceptable Products:
 - a. 16323 by Cooper Bussmann, Ellisville, MO www.bussmann.com
 - b. LBA363106 by Square D Co, Palatine, IL www.us.squared.com.
 - c. Equal as approved by Architect before bidding. See Section 01 6200.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 1. Conductors and cables shall be continuous from outlet to outlet.
 2. Do not use direct burial cable.
- B. Line Voltage Conductors (Over 70 Volts):
 1. Install conductors in raceway except where specifically indicated otherwise. Run conductors of different voltage systems in separate conduits.
 2. Route circuits at own discretion, however, circuiting shall be as shown in Panel Schedules. Group circuit homeruns to panels as shown on Drawings.
 3. Neutrals:
 - a. On three-phase, 4-wire systems, do not use common neutral for more than three circuits.
 - b. On single-phase, 3-wire systems, do not use common neutral for more than two circuits.
 - c. Run separate neutrals for each circuit where specifically noted on Drawings.
 - d. Where common neutral is run for two or three home run circuits, connect phase conductors to breakers in panel which are attached to separate phase legs so neutral conductors will carry only unbalanced current. Neutral conductors shall be of same size as phase conductors unless specifically noted otherwise.
 4. Pulling Conductors:
 - a. Do not pull conductors into conduit until raceway system is complete and cabinets and outlet boxes are free of foreign matter and moisture.
 - b. Do not use heavy mechanical means for pulling conductors.
 - c. Use only listed wire pulling lubricants.

END OF SECTION

SECTION 26 05 23**CONTROL-VOLTAGE ELECTRICAL CABLES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install control-voltage electrical cables as described in Contract Documents.
 - 2. Furnish and install building telephone / data system cables as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 01 1000: Owner will terminate building telephone cables at terminal board.
 - 2. Section 23 0933: Cables for Temperature Control System.
 - 3. Section 26 0501: Common Electrical Requirements.
 - 4. Section 28 3101: Cables for Fire Detection System.

1.2 REFERENCES

- A. Definitions:
 - 1. Control Voltage: 70 Volts and under.

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Manufacturers:
 - 1. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
 - a. Alpha Wire Co, Elizabeth, NJ www.alphawire.com.
 - b. Belden Wire & Cable Co, Richmond, IN www.belden.com.
 - c. Liberty Wire & Cable, Colorado Springs, CO www.libertycable.com.
 - d. West Penn Wire Corp, Washington, PA www.westpenn-cdt.com.
- B. Components:
 - 1. Building Telephone / Data System Cables.
 - a. CAT 5E, 24 AWG, solid bare copper, four pair, UTP.
 - b. Sheath Colors:
 - 1) Telephone: White.
 - 2) Data: Blue.
 - c. Meet requirements of EIA / TIA 568 Standard.
 - 2. Building Telephone System Cables:
 - a. CAT 5E, 24 AWG, solid copper, four pair, UTP, white cable jacket.
 - b. Meet requirements of TIA / EIA 568 Standard.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. General:
 - 1. Cables shall be continuous and without splices from terminal board to outlet.
 - 2. Install cables in raceway. Run cables of different systems in separate conduits.

3. Pulling Conductors:
 - a. Do not pull conductors into conduit until raceway system is complete and cabinets and outlet boxes are free of foreign matter and moisture.
 - b. Do not use heavy mechanical means for pulling conductors.
 - c. Use only listed wire pulling lubricants.
- B. Telephone / Data System Cables:
 1. Install cable from terminal board to each telephone and data outlet unless indicated otherwise on Drawings.
 2. Leave adequate slack cable at terminal board and outlets for termination of each cable run.
- C. Sound And Video Systems Cables:
 1. Label cables at each end with cable markers for use of sound system and video system installers.
 2. Run separate insulated No. 6 grounding conductor from each equipment cabinet to electrical panel. Do not use intermediate connections or splices.
 3. Extend cables **18 inches 450 mm** from wall or ceiling at all outlets and speaker locations. Extend cables and grounding conductors to twice vertical length of cabinet at each cabinet location.
 4. For cables not installed in metallic raceway, do not run cables within 10 inches of line voltage conductors / raceways. Also, maintain 10 inches minimum between following exposed cable groups:
 - a. Microphone cables.
 - b. CAT-5, CAT-6, sound system control, telephone, video, or ATC cables.
 - c. Loudspeaker cables.

END OF SECTION

SECTION 26 05 26**GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install grounding for electrical installation as described in Contract Documents except as excluded below.
- B. Related Requirements:
 - 1. Section 26 0501: Common Electrical Requirements.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference: Participate in pre-installation conference specified in Section 03 3111.

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Manufacturers:
 - 1. Type One Acceptable Products:
 - a. 'Cadweld' by Erico International, Solon, OH www.erico.com.
 - b. 'ThermOweld' by Continental Industries, Tulsa, NE www.conind.com.
 - c. Equal as approved by Architect before bidding. See Section 01 6200.
- B. Performance:
 - 1. Design Criteria: Size materials as shown on Drawings and in accordance with applicable codes.
- C. Materials:
 - 1. Grounding And Bonding Jumper Conductors: Bare copper or with green insulation.
 - 2. Make grounding conductor connections to ground rods and water pipes using approved bolted clamps listed for such use.
 - 3. Service Grounding Connections And Cable Splices: Make by exothermic process.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Interface With Other Work: Coordinate with Section 03 3111 in installing grounding conductor and placing concrete. Do not allow placement of concrete before Architect's inspection of grounding conductor installation.
- B. Grounding conductors and bonding jumper conductors shall be continuous from terminal to terminal without splice. Provide grounding for following.
 - 1. Electrical service, its equipment and enclosures.
 - 2. Conduits and other conductor enclosures.
 - 3. Neutral or identified conductor of interior wiring system.
 - 4. Main panelboard, power and lighting panelboards.

5. Non-current-carrying metal parts of fixed equipment such as motors, starter and controller cabinets, instrument cases, and lighting fixtures.
- C. Grounding connection to main water supply shall be accessible for inspection and made within **6 inches 150 mm** of point of entrance of water line to building. Provide bonding jumpers across water meter and valves to assure electrical continuity.
- D. Provide concrete-encased electrode system by embedding **20 feet 6 000 mm** minimum of No. 2/0 bare copper conductor in concrete footing, **2 inches 50 mm** minimum below concrete surface. Extend No. 2/0 copper conductor to main panel as shown on Drawings.
- E. Ground identified common conductor of electrical system at secondary side of main transformer supplying building. Ground identified grounded (neutral) conductor of electrical system on supply side of main service disconnect.
- F. Pull grounding conductors in non-metallic raceways, in flexible steel conduit exceeding **72 inches 1 800 mm** in length, and in flexible conduit connecting to mechanical equipment.
- G. Provide grounding bushings on all feeder conduit entrances into panelboards and equipment enclosures.
- H. Bond conduit grounding bushings to enclosures with minimum #10 AWG conductor.
- I. Connect equipment grounds to building system ground.
 1. Use same size equipment grounding conductors as phase conductors up through #10 AWG.
 2. Use NEC Table 250-95 for others unless noted otherwise in Drawings.
- J. Run separate insulated grounding cable from each equipment cabinet to electrical panel. Do not use intermediate connections or splices. Affix directly to cabinet.
- K. On motors, connect ground conductors to conduit with approved grounding bushing and to metal frame with bolted solderless lug.
- L. Ground cabinet of transformers to conduit and ground wires, if installed. Bond transformer secondary neutral conductor to cabinet.

3.2 FIELD QUALITY CONTROL

- A. Field Inspections: Notify Architect for inspection two days minimum before placing concrete over grounding conductor.

END OF SECTION

SECTION 26 05 33**RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Quality of material and installation procedures for raceway, boxes, and fittings used on Project but furnished under other Divisions.
 - 2. Furnish and install raceway, conduit, and boxes used on Project not specified to be installed under other Divisions.
 - 3. Installation of Owner supplied corner A/V equipment cabinets.
 - 4. Furnish and install main telephone service raceway as described in Contract Documents and to comply with telephone company requirements.
 - 5. Furnish and install main electrical service raceway to comply with electrical utility company requirements.
- B. Related Requirements:
 - 1. Section 26 0501: General Electrical Requirements.
 - 2. Section 26 0503: Local electrical utility company shall furnish and install primary underground service.
 - 3. Section 27 4117: Furnishing and installing of satellite dish and TV distribution systems by Church approved installer and not to be included as part of work of this Section.
 - 4. Section 27 5117: Furnishing and installing of sound system by Church approved installer and not to be included as part of work of this Section.
 - 5. Section 28 3100: Furnishing and installing of raceway and conduit for fire detection and alarm system.

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Cooper B-Line, Highland, IL www.b-line.com.
 - b. Hubbell Incorporated, Milford, CT www.hubbell-wiring.com.
 - c. Square D, Palatine, IL www.squared.com.
 - d. Steel City, Div Thomas & Betts, Memphis, TN www.tnb.com.
 - e. Thomas & Betts, Memphis, TN www.tnb.com.
 - f. Walker Systems Inc, Williamstown, WV (800) 240-2601.
 - g. Wiremold Co, West Hartford, CT www.wiremold.com.
- B. Performance:
 - 1. Design Criteria: All aspects of design of sound system have been included as requirements of Owner. Do not make changes to any aspects of installation, design, or equipment pertaining to sound system without Owner's approval through Architect and Sound Consultant.
- C. Materials:
 - 1. Raceway And Conduit:
 - a. Sizes:
 - 1) **3/4 inch 19 mm** for exterior use, unless indicated otherwise.
 - 2) **1/2 inch 13 mm** for interior use, unless indicated otherwise.
 - b. Types: Usage of each type is restricted as specified below by product.

- 1) Galvanized rigid steel or galvanized intermediate metal conduit (IMC) is allowed for use in all areas. Where in contact with earth or concrete, wrap buried galvanized rigid steel and galvanized IMC conduit and fittings completely with vinyl tape.
- 2) Galvanized Electrical Metallic Tubing (EMT), Flexible Steel Conduit, And Metal-Clad Cable (Type MC):
 - a) Allowed for use only in indoor dry locations where it is:
 - (1) Not subject to damage.
 - (2) Not in contact with earth.
 - (3) Not in concrete.
 - b) Flexible steel conduit or metal-clad cable required for final connections to indoor mechanical equipment.
- 3) Schedule 40 Polyvinyl Chloride (PVC) Conduit:
 - a) Allowed for use only underground or below concrete with galvanized rigid steel or IMC elbows and risers.
- 4) Listed, Liquid-Tight Flexible Metal Conduit:
 - a) Use in outdoor final connections to mechanical equipment, length not to exceed **36 inches 900 mm**.
- 5) Electrical Non-Metallic Tubing (ENT): Allowed for use only as a raceway for control voltage cables in concealed or inaccessible, indoor, dry locations.
- c. Prohibited Raceway Materials:
 - 1) Aluminum conduit.
 - 2) Armored cable type AC (BX) cable.
2. Raceway And Conduit Fittings:
 - a. Rigid Steel Conduit And IMC: Threaded and designed for conduit use.
 - b. EMT:
 - 1) Compression type.
 - 2) Steel set screw housing type.
 - c. PVC Conduit:
 - 1) PVC type. Use PVC adapters at all boxes.
 - 2) PVC components, (conduit, fittings, cement) shall be from same Manufacturer.
 - d. Flexible Steel Conduit: Screw-in type.
 - e. Liquid-tight Flexible Metal Conduit: Sealtite type.
 - f. Expansion fittings shall be equal to OZ Type AX sized to raceway and including bonding jumper.
 - g. Prohibited Fitting Materials:
 - 1) Crimp-on, tap-on, indenter type fittings.
 - 2) Cast set-screw fittings for EMT.
 - 3) Spray (aerosol) PVC cement.
3. Cord-Ended Metal Surface Raceway:
 - a. Grey finish.
 - b. **40 inches 1000 mm** long with **72 inch 1800 mm** long cord and grounding type plug.
 - c. Six receptacles spaced **6 inches 150 mm** on center.
 - d. Type One Acceptable Products:
 - 1) Wiremold G20-C4
 - 2) Equal as approved by Architect before bidding. See Section 01 6200.
4. Multi-Outlet Assemblies:
 - a. **18 inches 450 mm** between outlets.
 - b. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) 2GW Series by Walker.
 - 2) Plugmold 20GB Series by Wiremold.
5. Seal Devices: OZ Type WSK.
6. Outlet Boxes:
 - a. Galvanized steel of proper size and shape are acceptable for all systems. Where metal boxes are used, provide following:
 - 1) Provide metal supports and other accessories for installation of each box.
 - 2) Equip ceiling and bracket fixture boxes with fixture studs where required.
 - 3) Equip outlets in plastered, paneled, and furred finishes with plaster rings and extensions to bring box flush with finish surface.
 - b. Plastic boxes may be used only in low voltage systems where conductors are not installed in conduit.

- c. Telephone / data outlet boxes shall be single device outlet boxes.
- d. HVAC Instrumentation And Control:
 - 1) Junction boxes in mechanical equipment areas shall be 4 inches 100 mm square.
 - 2) Boxes for remote temperature sensor devices shall be recessed single device.
 - 3) Boxes for thermostats shall be 4 inches 100 mm square with raised single device cover.
- 7. Air / Vapor Barrier Back Boxes: Pre-molded polyethylene fitting between framing members and inhibiting air / vapor infiltration and exfiltration around recessed outlet boxes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm dimensions, ratings, and specifications of materials to be installed and coordinate these with site dimensions and with other Sections.

3.2 INSTALLATION

- A. Interface With Other Work:
 - 1. Coordinate with Divisions 22 and 23 for installation of raceway for control of plumbing and HVAC equipment.
 - 2. Before rough-in, verify locations of boxes with work of other trades to insure that they are properly located for purpose intended.
 - a. Coordinate location of outlet for water cooler with Division 22.
 - b. Coordinate location of outlets adjacent to or in millwork with Division 06 before rough-in. Refer conflicts to Architect and locate outlet under his direction.
 - 3. Coordinate installation of floor boxes in carpeted areas with carpet installer to obtain carpet for box doors.
 - 4. Install pull wires in raceways installed under this Section where conductors or cables are to be installed under other Divisions.
- B. General:
 - 1. Sound and video system electrical components furnished and installed under this Section include following items:
 - a. Metal equipment cabinet and control cabinets.
 - b. Factory-fabricated speaker enclosures.
 - c. Fittings.
- C. Conduit And Raceway:
 - 1. Conceal raceways within ceilings, walls, and floors, except at Contractor's option, conduit may be exposed on walls or ceilings of mechanical equipment areas and above acoustical panel suspension ceiling systems. Install exposed raceway runs parallel to or at right angles to building structure lines.
 - 2. Keep raceway runs 6 inches 150 mm minimum from hot water pipes.
 - 3. Make no more than four quarter bends, 360 degrees total, in any conduit run between outlet and outlet, fitting and fitting, or outlet and fitting.
 - a. Make bends and offsets so conduit is not injured and internal diameter of conduit is not effectively reduced.
 - b. Radius of curve shall be at least minimum indicated by NEC.
 - 4. Cut conduit smooth and square with run and ream to remove rough edges. Cap raceway ends during construction. Clean or replace raceway in which water or foreign matter have accumulated.
 - 5. Run two spare conduits from each new panelboard to ceiling access area or other acceptable accessible area and cap for future use.
 - 6. Bend PVC conduit by hot box bender and, for PVC 2 inches 50 mm in diameter and larger, expanding plugs. Apply PVC adhesive only by brush.
 - 7. Installation in Concrete:

- a. Install no conduit in concrete unless outside diameter is less than 1/3 of slab, wall, or beam thickness in which it is embedded.
 - b. Position conduits in center of concrete below reinforcing steel, and separated by minimum lateral spacing of three diameters.
 - c. Elbows embedded in concrete shall be rigid steel or IMC and stubouts from concrete slabs shall extend **3 inches 75 mm** minimum before making connection to EMT.
 - d. Separate conduits penetrating structural slabs in buildings by **2 inches 50 mm** minimum.
 - e. Install seal device where underground raceways penetrate concrete building wall.
8. Installation In Framing:
- a. Do not bore holes in joists or beams outside center 1/3 of member depth or within **24 inches 600 mm** of bearing points. Do not bore holes in vertical framing members outside center 1/3 of member width.
 - b. Holes shall be **one inch 25 mm** diameter maximum.
9. Underground Raceway And Conduit:
- a. Bury underground raceway installed outside building **24 inches 600 mm** deep minimum.
 - b. Bury underground conduit in planting areas **18 inches 450 mm** deep minimum. It is permissible to install conduit directly below concrete sidewalks, however, conduit must be buried **18 inches 450 mm** deep at point of exit from planting areas.
10. Conduit And Raceway Support:
- a. Securely support raceway with approved straps, clamps, or hangers, spaced as required.
 - b. Do not support from mechanical ducts or duct supports without Architect's written approval. Securely mount raceway supports, boxes, and cabinets in an approved manner by:
 - 1) Expansion shields in concrete or solid masonry.
 - 2) Toggle bolts on hollow masonry units.
 - 3) Wood screws on wood.
 - 4) Metal screws on metal.
11. Prohibited Procedures:
- a. Use of wooden plugs inserted in concrete or masonry units for mounting raceway, supports, boxes, cabinets, or other equipment.
 - b. Installation of raceway that has been crushed or deformed.
 - c. Use of torches for bending PVC.
 - d. Spray applied PVC cement.
 - e. Boring holes in truss members.
 - f. Notching of structural members.
 - g. Supporting raceway from ceiling system support wires.
 - h. Nail drive straps or tie wire for supporting raceway.
- D. Telephone / Data Systems:
1. Install main service raceway as directed by Telephone Company. Leave pull wire in raceway.
 2. Install raceway from terminal board to each telephone and data outlet unless indicated otherwise on Drawings.
- E. Boxes:
1. Boxes shall be accessible and installed with approved cover.
 2. Do not locate device boxes that are on opposite sides of framed walls in the same stud space. In other wall construction, do not install boxes back to back.
 3. Locate boxes so pipes, ducts, or other items do not obstruct outlets.
 4. Install outlets flush with finished surface and level and plumb.
 5. Support switch boxes larger than two-gang with side brackets and steel bar hangers in framed walls.
 6. At time of substantial completion, install blank plates on uncovered outlet boxes that are for future use.
 7. Location:
 - a. Install boxes at door locations on latch side of door, unless explicitly shown otherwise on Drawings. Verify door swings shown on electrical drawings with architectural drawings, and report discrepancies to Architect before rough-in. Distance of box from jamb shall be within **6 inches 150 mm** of door jamb.
 - b. Properly center boxes located in walls with respect to doors, panels, furring, trim and consistent with architectural details. Where two or more outlets occur, space them uniformly and in straight lines with each other, if possible.

- c. Center ceramic tile boxes in tile.
- F. Support factory-fabricated speaker enclosures from structure or ceiling suspension system.

END OF SECTION

SECTION 26 06 13**ELECTRICAL EQUIPMENT MOUNTING HEIGHT SCHEDULE****PART 1 - GENERAL: Not Used****PART 2 - PRODUCTS: Not Used****PART 3 - EXECUTION`****3.1 INSTALLATION**

- A. Unless otherwise indicated, mount center of outlets or boxes at following heights above finish floor. Refer special conditions to Architect before rough-in and locate outlet under his direction.
- B. Mounting Heights:
1. HVAC:
 - a. Temperature Control Junction Boxes: As indicated on Drawings.
 - b. Thermostats: As indicated on Drawings.
 - c. Remote Temperature Sensors:
 - 1) Wall-Mounted 56 inches 1 400 mm to top.
 - d. Other Motor Disconnects: 60 inches 1 500 mm.
 - e. Motor Controls: 60 inches 1 500 mm.
 2. Plumbing:
 - a. Electric Water Cooler Outlets: Mount so outlet and cord are hidden by water cooler.
 3. Electrical:
 - a. Distribution Panels: 72 inches 1 800 mm to top.
 - b. Receptacles: 18 inches 450 mm.
 - c. Wall Switches: 42 inches 1 050 mm.
 - d. Wall-Mounted Exit Lights: 90 inches 2 250 mm.
 - e. Emergency Lighting Units: 60 inches 1 500 mm.
 4. Communications
 - a. Sound Distribution System Components: As indicated on Drawings.
 - b. Satellite Distribution System Components: As indicated on Drawings.
 - c. TV Distribution System Components: As indicated on Drawings.
 - d. Computer and TV: 18 inches 450 mm.
 - e. Telephone / Data Terminal Boards: 72 inches 1 800 mm to top.
 - f. Telephones (wall type): 48 inches 1 200 mm.
 - g. Telephones (desk type): 18 inches 450 mm.
 - h. Signal Chimes: 84 inches 2 100 mm.

END OF SECTION

SECTION 26 24 17**CIRCUIT-BREAKER PANELBOARDS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install circuit-breaker panelboards as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 26 0501: Common Electrical Requirements.

PART 2 - PRODUCTS**2.1 EQUIPMENT**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Cutler-Hammer Inc, Pittsburgh, PA www.eatonelectric.com.
 - b. General Electric Industrial Systems, Charlotte, NC www.geindustrial.com.
 - c. Siemens Energy & Automation, Alphrata, GA www.sea.siemens.com.
 - d. Square D Co, Palatine, IL www.us.squared.com.
- B. Performance:
 - 1. Capacities:
 - a. Panelboard:
 - 1) Minimum integrated equipment short circuit rating of 22,000 amperes for 120 / 208 Volts.
 - 2) Minimum integrated equipment short circuit rating of 50,000 amperes for 277 / 280 Volts.
 - 3) Rated for use as service entrance equipment.
 - b. Lighting And Appliance Panelboards:
 - 1) Minimum integrated equipment short circuit rating of 10,000 amperes for 120 / 208 Volts.
 - 2) Minimum integrated equipment short circuit rating of 14,000 amperes for 277 / 480 Volts.
 - c. Load Centers:
 - 1) 125 Amp main lugs, 120 / 208 Volt, three-phase.
 - 2) Minimum integrated equipment short circuit rating of 10,000 Amps.
- C. Material:
 - 1. Circuit-breaker type.
 - 2. Galvanized steel cabinets
 - 3. Bussing and lugs arranged as required.
 - 4. Multi-pole circuit-breakers shall be common trip.
 - 5. Circuit-breakers shall be molded case thermal magnetic type with inverse time characteristics.
 - 6. Main Panelboard:
 - a. Surface-mounted and front accessible.
 - b. Enclosures:
 - 1) NEMA / CEMA Type 1.
 - c. Minimum dimensions of 32 inches 800 mm wide by 8 inches 200 mm deep.
 - d. Space designation on Drawings indicates bus hardware and panelboard capacity for future acceptance of one 100 Amp, three-pole circuit-breaker.

- e. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Type PRL4B by Cutler-Hammer.
 - 2) Spectra Series by General Electric.
 - 3) Type P4 by Siemens.
 - 4) I-Line by Square D.
- 7. Lighting And Appliance Panelboards:
 - a. Plug-on or bolt-on breakers. Multi-pole breakers shall be common trip.
 - b. Cabinets shall be locking type with no exposed latches or screws when door is closed. Key panels alike and provide minimum of three keys.
 - c. Minimum dimensions of 20 inches 500 mm wide by 5-3/4 inches 144 mm deep.
 - d. Space designation on Drawings indicates bus hardware and panelboard capacity for future acceptance of one 20 Amp, single-pole circuit-breaker.
 - e. Breakers specified to be shunt trip and shall include shunt trip accessories to remotely trip breaker using separate 120 V power source. Trip coil shall include coil-clearing contact to break coil current when breaker opens.
 - f. Use equipment from same manufacturer as main panelboard.
 - g. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Type PRL1a by Cutler-Hammer.
 - 2) Type AL or AQ by General Electric.
 - 3) Type P1 by Siemens.
 - 4) Type NQOD by Square D.
- 8. Load Centers:
 - a. Surface-mounted, outdoor NEMA Type 3R enclosure with padlocking provisions. 12-1/2 inches 318 mm wide by 4-1/2 inches 115 mm deep minimum.
 - b. HACR type circuit breakers.
 - c. Use equipment from same manufacturer as main panelboard.
 - d. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Type CH by Cutler-Hammer.
 - 2) Type PowerMark Plus by General Electric.
 - 3) Type EQ by Siemens.
 - 4) Type QO by Square D.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Label panelboards, and each breaker in main panelboard with 1/16 inch 1.5 mm thick laminated plastic composition material with contrasting color core. Engraved letters shall be 1/4 inch 6 mm high.
- B. Provide typewritten circuit schedules in lighting and distribution panelboards to identify panelboard and load served by each branch breaker.
- C. Arrange conductors neatly within panelboards and load centers.
- D. Secure to structure in accordance with requirements of Project seismic design category.

3.2 PROTECTION

- A. Protect panelboards, and interior components from paint, gypsum board compound, dirt, dust, and other foreign matter during construction.

END OF SECTION

SECTION 26 27 26**WIRING DEVICES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install wiring devices complete with plates as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 26 0501: Common Electrical Requirements.

PART 2 - PRODUCTS**2.1 COMPONENTS**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Cooper Wiring Devices, Peachtree City, GA www.cooperwiringdevices.com.
 - b. General Electric Industrial Systems, Charlotte, NC www.geindustrial.com.
 - c. Hubbell Building Automation, Austin, TX www.hubbell-automation.com.
 - d. Hubbell Inc, Milford, CT www.hubbell-wiring.com.
 - e. Hunt Control Systems Inc, Fort Collins, CO www.huntdimming.com.
 - f. Intermatic Inc, Spring Grove, IL www.intermatic.com.
 - g. Leviton Manufacturing Co, Little Neck, NY www.leviton.com.
 - h. Lightolier Controls, Dallas, TX www.lolcontrols.com.
 - i. Lutron Electronics Co Inc, Coopersburg, PA www.lutron.com.
 - j. Novitas Inc, Peachtree City, GA www.novitas.com.
 - k. Ortronics, New London, CT www.ortronics.com.
 - l. Paragon Electric Co Inc, Carol Stream, IL www.icca.invensys.com/paragon.
 - m. Pass & Seymour, Syracuse, NY www.passandseymour.com.
 - n. Red Dot div of Thomas & Betts, Memphis, TN www.tnbcom.
 - o. Siemon Company, Watertown, CT www.siemon.com.
 - p. Square D Co, Palatine, IL www.squared.com.
 - q. Suttle, Hector, MN www.suttleonline.com.
 - r. Tork Inc, Mount Vernon, NY www.tork.com.
 - s. Watt Stopper Inc, Santa Clara, CA www.wattstopper.com.
 - 2. Product Options:
 - a. Faces shall be nylon where available.
 - b. Devices of single type shall be from same Manufacturer.
 - c. Devices are listed as white. Use white devices on light colored walls and brown on dark walls.
- B. Switches:
 - 1. Rectangular Face Designer Style:
 - a. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) 20 AMP, single pole:
 - a) Cooper: DECB120W.
 - b) Hubbell: HBL2121WA.
 - c) Leviton: 5621-2W.
 - d) Pass & Seymour: 2621-W.
 - 2) Two Pole:
 - a) Cooper: DECB220W.

- b) Hubbell: HBL2122WA.
 - c) Leviton: 5622-2W.
 - d) Pass & Seymour: 2622-W.
 - 3) Three Way:
 - a) Cooper: DECB320W.
 - b) Hubbell: HBL2123WA.
 - c) Leviton: 5623-2W.
 - d) Pass & Seymour: 2623-W.
 - 4) Four Way:
 - a) Cooper: DECB420W.
 - b) Hubbell: HBL2124WA.
 - c) Leviton: 5624-2W.
 - d) Pass & Seymour: 2624-W.
- 2. Exhaust Fan Timer Switches:
 - a. Rest Rooms and Mother's Room:
 - 1) 0-15 minute, no hold position.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Intermatic: FD15MWC.
 - b) Paragon: SWD15M-W.
 - c) Tork: A515MW.
 - b. Font:
 - 1) 0-4 Hour, no hold position.
 - 2) Approved Products:
 - a) Intermatic: FDHW.
 - b) Tork: A504HW.
 - c. Custodian Room:
 - 1) 24 hour, in-wall, multiple automatic ON-OFF settings.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Intermatic: E1020.
 - b) Tork: 701A.
- 3. Dimmer Switches:
 - a. Vertical slide control with faceplate.
 - b. Preset, ON-OFF switch, 1000VA.
 - c. Approved Products:
 - 1) Hubbell: AS101/AS1L.
 - 2) Hunt: DAP-10-IV.
 - 3) Leviton: IPI10-I.
 - 4) Lightolier: MP1000-I.
 - 5) Lutron: N-1003P-IV.
 - 6) Pass & Seymour: 91180-I.
- C. Receptacles:
 - 1. Rectangular Face Designer Style:
 - a. 15 AMP, specification grade, back and side wired, self grounding.
 - b. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Cooper: 6262W.
 - 2) Hubbell: HBL2152WA.
 - 3) Leviton: 16252-W.
 - 4) Pass & Seymour: 26252-W.
 - 2. Ground Fault Circuit Interrupter (GFCI):
 - a. 15 AMP, specification grade.
 - b. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Cooper: GF15W.
 - 2) Hubbell: GF5252WA.
 - 3) Leviton: 8599-W.
 - 4) Pass & Seymour: 1594-W.
 - 3. Basketball Standard Receptacle:
 - a. Three pole, four wire grounding, 125 / 250V, locking type, NEMA L14-20R, 20 AMP, complete with plate.

- b. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Cooper: CWL1420R
 - 2) Hubbell: HBL2410
 - 3) Leviton: 2410
 - 4) Pass & Seymour: L1420-R
- D. Telephone Jacks:
 - 1. Desk Type:
 - a. 4 conductor, screw terminals, voice grade.
 - b. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Cooper: 3532-4W.
 - 2) Leviton: 40249-W.
 - 3) Pass & Seymour: TPTE1-W.
 - 4) Suttle: 625B4-4-85.
 - 2. Wall Type:
 - a. 4 conductor, screw terminals, voice grade.
 - b. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Cooper: 3521-4W.
 - 2) Leviton: 40257-W.
 - 3) Pass & Seymour: WMTE14-W.
 - 4) Suttle: 630AC4-85.
 - 3. Module Type:
 - a. For use in data faceplates.
 - b. 8 conductor, punch-down, voice grade.
 - c. Type Two Acceptable Products:
 - 1) Siemon: MX3-F-U3-02
 - 2) Equal as approved by Architect before use. See Section 01 6200.
- E. Data Jacks:
 - 1. For use in data faceplates.
 - 2. 8 conductor, punch-down T568B wiring configuration, CAT 5e.
 - 3. Type Two Acceptable Products:
 - a. Flat Jack: Siemon MX5-F02
 - b. Angled Jack: Siemon MX5-02
 - c. Equal as approved by Architect before use. See Section 01 6200.
- F. Plates:
 - 1. Standard Cover Plates:
 - a. Office / Occupied Areas:
 - 1) Nylon or high impact resistant thermoplastic.
 - 2) Color shall match wiring device.
 - b. All Other: Stainless Steel.
 - c. Ganged switches shall have gang plates.
 - d. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Cooper.
 - 2) Hubbell.
 - 3) Leviton.
 - 4) Pass & Seymour.
 - 2. Data Faceplates:
 - a. Type Two Acceptable Products:
 - 1) Single Module: Siemon MX-FP-S-01-02.
 - 2) Two Modules: Siemon MX-FP-S-02-02.
 - 3) Equal as approved by Architect before use. See Section 01 6200.
 - 3. Weatherproof In-Use Receptacle Covers:
 - a. NEMA 3R rated.
 - b. Cast aluminum.
 - c. Compatible with GFCI receptacles.
 - d. Complete with weather resistant gaskets and stainless steel screws.
 - e. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Hubbell: WP26MH, horizontal; WP26M, vertical.

- 2) Intermatic: WP1010HMC, horizontal; WP1010MC, vertical.
- 3) Red Dot: CKMG, horizontal; CKMGV, vertical.

G. Occupancy Sensors:

1. Ceiling, ultrasonic type.
 - a. Complete with sensor and combined relay / control transformer.
 - b. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Leviton:
 - a) Sensor: OSC10-U
 - b) Relay / Transformer: OSP20-OD)
 - 2) Hubbell:
 - a) Sensor: OMNI-US500.
 - b) Relay / Transformer: 120 V: MP 120 A or 277 V: MP 277 A.
 - 3) Novitas:
 - a) Sensor: 01-083.
 - b) Relay / Transformer: 120 / 277 V, 13-0511.
 - 4) Pass & Seymour: 120 V.
 - a) Sensor: US1001.
 - b) Relay / Transformer: PWP120.
 - 5) Tork:
 - a) Sensor: SC20.
 - b) Relay / Transformer: 120 V: TRP1 or 277 V: TRP2.
 - 6) Watt Stopper:
 - a) Sensor: W-500A.
 - b) Relay / Transformer: 120 V: B120E-P or 277 V: A277E-P.

H. Data Patch Panel:

1. Panel:
 - a. Meet requirements of TIA / EIA 568 Standard.
 - b. CAT 5e, 48 ports groups in eight 6-port modules, T568B wiring configuration, 19 inch 475 mm width.
 - c. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Cooper: 5548.
 - 2) Leviton: 5G548-U48.
 - 3) Ortronics: OR-851004038.
 - 4) Suttle: 2-7032-48.
2. Mounting Bracket:
 - a. Hinged, wall mounted, 19 inches wide by 5 inches deep.
 - b. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Cooper: 5549-2.
 - 2) Leviton: 49251-W62.
 - 3) Ortronics: OR-604004068.
 - 4) Suttle: 103B1.

I. Secondary Surge (Lightning) Arresters:

1. Protection from Category C level transient surges as defined in IEE / ANSI C62.11 and C62.41. UL approved for exterior application.
2. Parallel metal oxide varistors, MOV, from each line to ground. 120 / 240 VAC. UV resistant construction with epoxy encapsulation of electrical connections.
3. Include 1/2 inch mounting nipple and locknut.
4. Category Four approved Products. See Section 01 6200 for definitions of Categories.
 - a. ASZ175B2 by Cooper Power Systems.
 - b. 9L15FCB001 by General Electric.
 - c. AG2401C by Intermatic.
 - d. 54175-SSA by Leviton.
 - e. SDSA1175 by Square D.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install devices flush with walls, straight, and solid to box.
- B. Label dimmer switch groupings with 1/16 inch 1.5 mm thick laminated plastic composition material with contrasting color core. Engraved letter shall be 1/4 inch 6 mm high.
- C. Install secondary surge arrestor in knock-out of junction box installed on bottom of automatic sprinkler controller.

END OF SECTION

SECTION 26 28 16**ENCLOSED SWITCHES AND CIRCUIT BREAKERS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install disconnects as described in Contract Documents, except those provided integral with equipment.
- B. Related Requirements:
 - 1. Section 26 0501: Common Electrical Requirements.

PART 2 - PRODUCTS**2.1 ASSEMBLIES**

- A. Manufacturers:
 - 1. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
 - a. Disconnects: Same as Manufacturer of Project's main panelboard.
 - b. Fuses.
 - 1) Cooper Bussmann, Ellisville, IL www.cooperbussmann.com.
 - 2) Edison Fuse, Ellisville, IL (314) 391-3443.
 - 3) Ferraz Shawmut, Newburyport, MA www.ferrazshawmut.com.
 - 4) Littelfuse Inc, Des Plaines, IL www.littelfuse.com.
- B. Disconnects:
 - 1. Heavy-duty quick-make, quick-break type, non-fused unless indicated otherwise.
 - 2. Provide interlock to prevent opening of door when switch is in ON position.
 - 3. Provide means to lock switch in OFF position with padlock.
 - 4. Disconnects for motor circuits shall be horsepower rated
 - 5. Disconnects For Furnace Units And Unit Heaters: Provide manual starter with thermal overload relay. Provide overload relay to match motor full load amps.
 - 6. Enclosures:
 - a. Interior: NEMA / CEMA Type 1.
 - b. Exterior: NEMA / CEMA Type 3R.
 - 7. Fuses:
 - a. Fuse fused disconnects with dual-element time delay fuses and equip with rejection type fuse holders.
 - b. Fuses on Project shall be from single manufacturer.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Label disconnects to indicate equipment served, such as Condensing Unit CU-1. Use **1/16 inch 1.5 mm** thick laminated plastic composition material with contrasting color core. Engraved letters shall be **1/4 inch 6 mm** high. Attach labels with screws.

END OF SECTION

SECTION 26 29 13**ENCLOSED CONTROLLERS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install motor starters and thermal units as described in Contract Documents, except those furnished as integral part of mechanical equipment.
- B. Related Requirements:
 - 1. Division 23: Motor starters and thermal units included as part of mechanical equipment.
 - 2. Section 26 0501: Common Electrical Requirements

PART 2 - PRODUCTS**2.1 ASSEMBLIES**

- A. Manufacturers:
 - 1. Category Four Approved Manufacturer. See Section 01 6200 for definitions of Categories.
 - a. Same manufacturer as Project's main panelboard.
- B. Material:
 - 1. Motor Starters:
 - a. General:
 - 1) Full voltage magnetic type rated in accordance with NEMA / CEMA standards, sizes, and horsepower ratings. Each starter shall include 100 VA control transformer rated 120/24 v. Fuse as required for class 2 wiring.
 - 2) Provide auxiliary contacts as required by Division 15.
 - 3) Provide solid state overload protection which includes but is not limited to:
 - a) Phase unbalance and phase loss protection.
 - b) Visible trip indication.
 - c) Trip test function.
 - d) Current adjustment over full range if starter's capacity.
 - e) Adjustment dial tamper guard.
 - 4) HAND-OFF-AUTO selector switch.
 - b. Include for Single Speed Starters:
 - 1) Red run light.
 - c. Include for Two Speed Starters:
 - 1) Designed for separate winding variable torque motors.
 - 2) High / low push button switch to select fan speed when operating in hand mode.
 - 3) Green high and red low speed run lights. Lights shall also be labeled.
 - 4) Separate overload units for high and low speed windings.
 - 5) Mechanical interlocks to prevent engaging both windings simultaneously.
 - 6) Provide time delay relay adjustable from 15 seconds to one minute for delay of starting motors when changing speeds.
 - d. Include for Duplex Motor Starters:
 - 1) Alternate operation of each pump upon each successive starting.
 - 2) Starting of second motor upon shutdown or failure of running motor.
 - 3) Red run lights for each motor.
 - 4) Wiring for control from single pole pilot device.
 - 5) Receive power supply for both motors from single feeder. Under no conditions shall both motors run simultaneously.

2. Enclosures: When not installed in motor control center, provide NEMA / CEMA Type 1 or, where required to be weatherproof, NEMA / CEMA Type 3R.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Interface With Other Work: Coordinate with appropriate Sections of Divisions 23 to determine necessary auxiliary contacts.
- B. Size overload units based on nameplate full load current of actual motors installed.
- C. Install each overload unit so catalog number is visible.
- D. If starter is mounted separate from disconnect, provide label on starter indicating equipment served, such as Condensing Unit CU-1. Use **1/16 inch 1.6 mm thick** laminated plastic composition material with contrasting color core. Engraved letters shall be **1/4 inch 6 mm**.

END OF SECTION

SECTION 26 51 00**INTERIOR LIGHTING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install lighting system as described in Contract Documents, complete with lamps.
- B. Related Requirements:
 - 1. Section 26 0501: Common Electrical Requirements.

PART 2 - PRODUCTS**2.1 ASSEMBLIES**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Advance Transformer Co, Rosemont, IL www.advancetransformer.com.
 - b. General Electric Lighting, Hendersonville, NC www.gelighting.com/na.
 - c. Howard Lighting Products, Laurel, MS www.howard-ind.com.
 - d. Novitas Inc, Peachtree City, GA www.novitas.com.
 - e. Osram Sylvania, Danvers, MA www.sylvania.com.
 - f. Philips Lighting Co, Somerset, NJ www.lighting.philips.com/nam.
 - g. Universal Lighting Technologies, Nashville, TN www.universalballast.com.
 - h. Venture Lighting International, Solon, OH www.venturelighting.com.
 - i. Watt Stopper Inc, Santa Clara, CA www.wattstopper.com.
 - j. Westinghouse Lighting Corp, Philadelphia, PA www.westinghouselightbulbs.com.
 - 2. Product Options: When several lighting fixtures are specified by name for one use on Drawings, select any one of those specified. Do not mix fixtures from different manufacturers specified for one use.
- B. Materials
 - 1. Lighting Fixtures:
 - a. Type One Acceptable Products:
 - 1) See Fixture Schedule on Drawings for acceptable manufacturers and models.
 - 2) Equals as approved by Architect before bidding. See Section 01 6200.
 - 2. Led Light Fixtures:
 - a. General.
 - 1) LED light fixtures shall be in accordance with IES, NFPA, UL, as shown on drawings, and as specified.
 - 2) LED light fixture shall be Reduction of Hazardous Substances (RoHS)-compliant.
 - 3) LED drivers shall include the following features unless otherwise indicated:
 - a) Minimum efficiency: 85% at full load.
 - b) Minimum Operating Ambient Temperature: -20°C. (-4°F.)
 - c) Input Voltage: 120-277V (±10%) at 60Jz.
 - d) Integral short circuit, open circuit, and overload protection.
 - e) Power Factor: ≥0.95.
 - f) Total Harmonic Distortion: ≤20%.
 - g) Comply with FCC 47 CFR Part 15.
 - 4) LED Modules shall include the following features unless otherwise indicated:
 - a) Comply with IES LM-79 and LM-80 required.

- b) Minimum CRI80 and color temperature 3000K unless otherwise specified in Lighting Fixture Schedule.
 - c) Minimum Rated Life: 50,000 hours per IES L70.
 - d) Light output lumens as indicated in the Lighting Fixture Schedule.
- b. LED Downlights:
 - 1) Housing, LED driver, and LED module shall be products of the same manufacturer.
- c. LED Troffers:
 - 1) LED drivers, modules, and reflector shall be accessible, serviceable, and replaceable from below the ceiling.
 - 2) Housing, LED driver, and LED module shall be products of the same manufacturer.
- C. Factory Assembly:
 - 1. Fixtures shall be fully assembled complete with necessary wiring, sockets, lamps, reflectors, drivers, auxiliaries, plaster frames, recessing boxes, hangers, supports, lenses, diffusers, and other accessories essential for complete working installation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Interface With Other Work:
 - 1. Coordinate with Sections under 09 5000 heading to obtain symmetrical arrangement of fixtures in acoustic tile ceiling.
 - 2. Coordinate with Sections under 09 9000 heading to ensure that light coves are properly painted before installation of light fixtures.
 - 3. In mechanical equipment rooms, coordinate locations of light fixtures with equipment locations to provide proper room illumination without obstruction. Suspend fixtures that must be mounted below pipes, ducts, etc, with chains or other Architect approved method.
- B. Securely mount fixtures. Support fixtures weighing 50 lbs 23 kg or more from building framing or structural members.
- C. Fasten lay-in fixtures to ceiling suspension system on each side with bolts, screws, rivets, or clips. In addition, connect lay-in fixtures weighing less than 50 lbs 23 kg with two-wire hangers minimum to building framing or structural members. Connect wires to opposing corners of fixture and may be slightly slack. Make final conduit connections to lay-in fixtures with specified flexible conduit or flexible fixture whips.
- D. Where recessed fixtures are to be installed, provide openings, plaster rings, etc, of exact dimensions for such fixtures to be properly installed. Coordinate fixture installation with ceiling type and thickness. Terminate circuits for recessed fixtures in an extension outlet box near fixture and connect with specified flexible conduit.
- E. Do not locate fixtures in closet or storage areas within 18 inches 450 mm and fixtures within 6 inches 150 mm of shelves.

3.2 ADJUSTMENT

- A. Repair scratches or nicks on exposed surfaces of fixtures to match original undamaged conditions.

END OF SECTION

SECTION 26 52 00**EMERGENCY LIGHTING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install emergency battery units as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 26 0501: Common Electrical Requirements.

PART 2 - PRODUCTS**2.1 SYSTEMS**

- A. Manufacturers:
 - 1. Manufacturer List:
 - a. Bodine Emergency Lighting, Collierville, TN www.bodine.com
 - b. Dual-Lite, Cheshire, CT www.dual-lite.com.
 - c. Iota Engineering Co, Tucson, AZ www.iotaengineering.com
 - d. Lightolier, Fall River, MA www.lightolier.com.
 - e. Lithonia Lighting, Conyers, GA www.lithonia.com.
 - f. McPhilbin / Day-Brite Lighting, Tupelo, MS www.mcphilben.com.
 - g. Sure-Lites / Cooper Lighting, Elk Grove, IL www.cooperlighting.com.
- B. Materials:
 - 1. Battery Packs:
 - a. General:
 - 1) Batteries shall be long life nickel cadmium type.
 - 2) Complete with charging indicator light and test switch.
 - 3) Factory-installed in lighting fixture, or capable of being field-installed to same standards.
 - b. Standard Linear Fluorescent Fixtures:
 - 1) Shall operate one lamp of fluorescent lighting fixture at approximately 600 lumens initially and 60 percent minimum of initial lumens after 90 minutes.
 - 2) Charger shall be capable of full recharge in 24 hours.
 - c. Recessed Downlight Fluorescent Fixtures:
 - 1) Shall operate lamp(s) of lighting fixture for 90 minutes minimum.
 - 2) Components shall be easily accessible for maintenance.
 - 2. Emergency Lighting Units And Remote Lighting Heads:
 - a. Shall operate indicated number of lamps for 90 minutes of emergency operation.
 - b. Sealed, maintenance free, lead calcium type battery.
 - c. Painted steel housing and complete with power indicator light and test switch.
 - d. Lamps shall be 12 Watt, 12 Volts in metal housing designed for wet locations and with mounting plate that allows full vertical and horizontal adjustment of lamps.
 - e. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Sure-Lites / Cooper Lighting:
 - a) No Lamp Unit: XR12208-0-SD.
 - b) Remote Two Lamp Lighting Head: 12T-12-DWMHWH.
 - 2) Dual-Lite:
 - a) No Lamp Unit: LM66-12V-0.
 - b) Remote Two Lamp Lighting Head: OMSDW1212.
 - 3) Lightolier:

- a) No Lamp Unit: E4250LW.
- b) Remote Two Lamp Lighting Head: MP2(2)CH1212.
- 4) Lithonia Lighting:
 - a) No Lamp Unit: ELT50WRO.
 - b) Remote Two Lamp Lighting Head: ELATMTH1212.
- 5) McPhilbin / Day-Brite Lighting:
 - a) No Lamp Unit: ES12L-50W.
 - b) Remote Two Lamp Lighting Head: (2)MCE-MP2W.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Battery Packs:
 - 1. General:
 - a. Wire so unit can be tested with lights on.
 - b. Wire so lamps in normal mode are switched off with other lighting in area. Connect unit to unswitched conductor of normal lighting circuit.
 - 2. Recessed Downlight Fluorescent Fixtures: If indicator light and test switch cannot be installed within fixture, install on plate adjacent to fixture.
 - 3. Other Fluorescent Fixtures: Install in ballast channel of fixture with charging indicator light and test switch mounted on fixture end, or visible and accessible through lens.

END OF SECTION

SECTION 26 56 00**EXTERIOR LIGHTING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install exterior lighting system as described in Contract Documents.
- B. Products Furnished But Not Installed Under This Section:
 - 1. Anchor bolts.
- C. Related Requirements:
 - 1. Section 03 3053: Concrete bases for light poles and installation of anchor bolts.
 - 2. Section 26 0501: Common Electrical Requirements.

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Cutler-Hammer Inc, Milwaukee, WI www.cutler-hammer.eaton.com.
 - b. General Electric Industrial Systems, Charlotte, NC www.geindustrial.com.
 - c. Intermatic Inc, Spring Grove, IL www.intermatic.com.
 - d. Paragon Electric Co Inc, Carol Stream, IL www.icca.invensys.com/paragon.
 - e. Siemens Energy & Automation, Alphrata, GA www.sea.siemens.com.
 - f. Square D Co, Palatine, IL www.squared.com.
 - g. Tork Inc, Mount Vernon, NY www.tork.com.
- B. Materials:
 - 1. Exterior Fixtures:
 - a. Finish shall meet requirements of AAMA 603.8 for baked-on organic coating, AAMA 605.2 high performance organic coating, or AAMA Architectural Class I anodizing as necessary to provide specified color.
 - b. Color shall be Manufacturer's standard white, natural aluminum, or medium bronze as selected by Architect before bidding.
 - c. Type One Acceptable Products:
 - 1) As indicated on Fixture Schedule. Do not mix fixtures from different manufacturers for one use.
 - 2) Equals as approved by Architect before bidding. See Section 01 6200.
 - 2. Parking Area Poles:
 - a. Designed for wind loading required for Project location as determined by Architect.
 - b. Aluminum hinged base type with matching aluminum anchor bolt cover secured to base.
 - c. Include hand hole with cover at pole base.
 - d. Finish And Color: Match parking area fixtures.
 - 3. Exterior Lighting Control:
 - a. Time Switch:
 - 1) Standard 24-hour dial time switch, 120 volts, NEMA 1 enclosure.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Intermatic: T101.
 - b) Paragon: 4001-00.
 - c) Tork: 1101.

- b. Photo Cell:
 - 1) 120 volts.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Intermatic: K4121.
 - b) Paragon: CW201-00.
 - c) Tork: 2101.
- c. Lighting Contactor:
 - 1) 120 volt coil, 20 amps, 2 pole, NEMA 1 enclosure.
 - 2) By same manufacturer as main panelboard.
 - 3) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - a) Cutler Hammer: CN35.
 - b) General Electric: CR260L-21CA22.
 - c) Siemens: CLH1B4212A803.
 - d) Square D: Class 8903, Type LG-20.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Interface With Other Work: Coordinate location of anchor bolts and conduit in concrete bases so pole will be properly mounted and centered on base.
- B. Lighting Control:
 - 1. Install time switches, manual bypass switches, and contactor inside building to control parking area and building exterior lighting. Label each component to identify lighting controlled, I.E. 'PARKING LIGHTING' or 'BUILDING LIGHTING.' Label with **1/16 inch 1.5 mm** thick laminated plastic composition material with contrasting color core. Engraved letters shall be **1/4 inch 6 mm** high.
 - 2. Locate photocell outside building under soffit and away from any light source and direct sunlight.
 - 3. Wire photocell and time switch in series for photo cell ON, time switch OFF operation.

3.2 CLOSEOUT ACTIVITIES

- A. Instruction Of Owner:
 - 1. Before Substantial Completion, meet with personnel designated by Owner to:
 - a. Identify location of control system components.
 - b. Explain operation of each component.
 - c. Demonstrate adjustment capabilities of time clocks, including turning systems OFF at times other than sunrise and keeping systems OFF on days facility is closed.
 - d. Set time clocks as directed.

END OF SECTION