



CENTRALBIDDING
FROM CENTRAL AUCTION HOUSE

**23-JULY-1701 Jefferson Parish Sheriff's Office Warehouse Tornado
Repairs**

Jefferson Parish Sheriff's Office

Project documents obtained from www.CentralBidding.com

26-Jun-2023 02:55:49 PM

BIDDING DOCUMENTS SUBMITTAL

**JEFFERSON PARISH SHERIFF'S OFFICE
WAREHOUSE TORNADO REPAIRS**

**1801 WESTBANK EXPRESSWAY
HARVEY, LOUISIANA 70058**

JUNE 9, 2023

**N-Y JOB NUMBER: 21023
JP Bid No. 23-JULY-1701**



TABLE OF CONTENTS

Division 0 – Procurement and Contracting Requirements

DOCUMENT 00100 – ADVERTISEMENT FOR BID	ADV-1 thru 3
DOCUMENT 00200 – INSTRUCTIONS TO BIDDERS	1 thru 9
DOCUMENT 00410 – LOUISIANA UNIFORM PUBLIC WORK BID FORM	1 thru 2
DOCUMENT 00432 – BID BOND	BB-1 thru 3
DOCUMENT 00440 – CORPORATE RESOLUTION	1
DOCUMENT 00456 – NON-COLLUSION AFFIDAVIT	1
DOCUMENT 00500 – FORM OF AGREEMENT	1 thru 8
DOCUMENT 00615 – PERFORMANCE BOND AND PAYMENT BOND	1 thru 5
DOCUMENT 00650 - STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT	1 thru 71
DOCUMENT 00655 – SUPPLEMENTARY CONDITIONS	1 thru 8
DOCUMENT 00672 - ARCHITECTURAL CERTIFICATION PAGES	1 thru 2
DOCUMENT 00674 - STRUCTURAL CERTIFICATION PAGES	1

Division 1 – General Requirements

SECTION 011000 – SUMMARY	1 thru 4
SECTION 012 00 – SUBSTITUTION PROCEDURES	1 thru 3
SECTION 012600 – CONTRACT MODIFICATION PROCEDURES	1 thru 3
SECTION 012900 – PAYMENT PROCEDURES	1 thru 6
SECTION 013100 – PROJECT MANAGEMENT AND COORDINATION	1 thru 11
SECTION 013233 – PHOTOGRAPHIC DOCUMENTATION	1 thru 4
SECTION 013300 – SUBMITTAL PROCEDURES	1 thru 11
SECTION 013516 – ALTERATION PROJECT PROCEDURES	1 thru 8
SECTION 014000 – QUALITY REQUIREMENTS	1 thru 11
SECTION 014200 – REFERENCES	1 thru 8
SECTION 015000 – TEMPORARY FACILITIES AND CONTROLS	1 thru 11
SECTION 016000 – PRODUCT REQUIRMENTS	1 thru 5
SECTION 017300 – EXECUTION	1 thru 10
SECTION 017419 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL	1 thru 4
SECTION 017700 – CLOSEOUT PROCEDURES	1 thru 7
SECTION 017823 – OPERATION AND MAINTENANCE DATA	1 thru 9
SECTION 017839 – PROJECT RECORD DOCUMENTS	1 thru 4
SECTION 017900 – DEMONSTRATION AND TRAINING	1 thru 4

Division 2 – Site Work and Existing Conditions

SECTION 024119 – SELECTIVE DEMOLITION 1 thru 5

Division 3 – Concrete (NOT USED)

Division 4 – Masonry and Stone

SECTION 042200 – CONCRETE UNIT MASONRY 1 thru 18
SECTION 042613 – MASONRY VENEER 1 thru 12

Division 5 – Metals

SECTION 051200 – STRUCTURAL STEEL FRAMING 1 thru 7
SECTION 052100 – STEEL JOIST FRAMING 1 thru 4
SECTION 053100 – STEEL DECKING 1 thru 5
SECTION 053400 – COLD FORMED FRAMING 1 thru 9

Division 6 – Wood, Plastics and Composites

SECTION 061053 – MISCELLANEOUS ROUGH CARPENTRY 1 thru 5
SECTION 062100 – FINISH CARPENTRY & MILLWORK 1 thru 4

Division 7 – Thermal and Moisture Protection

SECTION 070150 – PREPARATION FOR REROOFING 1 thru 6
SECTION 072116 – CLOSED CELL SPRAY FOAM INSULATION 1 thru 5
SECTION 074113 – STANDING SEAM METAL ROOFING 1 thru 13
SECTION 074213 – FORMED METAL WALL PANELS 1 thru 11
SECTION 074800 – RAINSCREEN ATTACHMENT SYSTEM 1 thru 9
SECTION 076210 – SHEET METAL FLASHING AND TRIM 1 thru 11
SECTION 078410 – THROUGH PENETRATION FIRESTOPPING SYSTEMS 1 thru 8
SECTION 079200 – JOINT SEALANTS 1 thru 8

Division 8 – Openings

SECTION 081113 – HOLLOW METAL DOORS & FRAMES 1 thru 6
SECTION 082100 - WOOD DOORS 1 thru 5
SECTION 083323 – ROLLING SERVICE DOORS 1 thru 5
SECTION 087100 – FINISH HARDWARE 1 thru 14

Division 9 – Finishes

SECTION 092216 – NON-STRUCTURAL METAL FRAMING 1 thru 8
SECTION 092900 – GYPSUM BOARD 1 thru 6

SECTION 095000 – CERAMIC TILE	1 thru 8
SECTION 095000 – ACOUSTICAL TREATMENT	1 thru 3
SECTION 096513 – RESILIENT ACCESSORIES	1 thru 5
SECTION 096519 – RESILIENT TILE FLOORING	1 thru 7
SECTION 098000 – CARPET	1 thru 6
SECTION 099123 – PAINTING	1 thru 7

Division 10 – Specialties

SECTION 101600 – TOILET PARTITIONS	1 thru 3
SECTION 102000 – LOUVERS AND VENTS	1 thru 2
SECTION 102116 – PLASTIC SHOWER COMPARTMENTS	1 thru 4
SECTION 107320 – ALUMINUM CANOPIES	1 thru 5
SECTION 108100 – TOILET AND BATH ACCESORIES	1 thru 3

Division 11 – Equipment (NOT USED)

Division 12 – Furnishings (NOT USED)

Division 13 – Special Construction (NOT USED)

Division 14 - Conveying Systems (NOT USED)

Division 20 – Mechanical Support

200000 – MECHANICAL GENERAL PROVISIONS

Division 21 – Fire Suppression

211000 – FIRE PROTECTION SYSTEMS

Division 22 – Plumbing (SEE DRAWINGS)

Division 23 – HVAC

230500 – HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS
230900 – HEATING, VENTILATING AND AIR CONDITIONING CONTROL SYSTEMS

Division 25 – INTEGRATION AND AUTOMATION (NOT USED)

Division 26 – Electrical Systems

260000 – ELECTRICAL GENERAL PROVISIONS
260500 – ELECTRICAL BASIC MATERIALS AND METHODS

262000 – ELECTRICAL SERVICE AND DISTRIBUTION
265000 – ELECTRICAL LIGHTING

Division 27 – Communications

270500 - COMMUNICATIONS SYSTEMS

Division 28 – Electronic Safety and Security

283100 – FIRE ALARM SYSTEM

CONSTRUCTION DOCUMENT 100% SUBMITTAL
JEFFERSON PARISH SHERIFF'S OFFICE
WAREHOUSE TORNADO REPAIRS

JUNE 9, 2023
N-Y JOB NO.: 21023

DOCUMENT 00100

**JEFFERSON PARISH SHERIFF'S OFFICE
WAREHOUSE TORNADO REPAIRS
1801 WESTBANK EXPRESSWAY
HARVEY, LA 70058**

ADVERTISEMENT FOR BIDS

Sealed bids will be received by the Jefferson Parish Sheriff's Office 1233 Westbank Expressway, 2nd Floor Conference Room, Harvey, LA 70058 until 2:00 P.M. on Monday, July 17, 2023.

Bids will be publicly opened and read aloud at that time, and a tabulation will be made for consideration by the Owner in awarding the Contract.

Bids received after the above-designated date and time will not be opened and will be rejected.

ANY PERSON REQUIRING SPECIAL ACCOMMODATIONS SHALL NOTIFY THE OWNER OF THE TYPE(S) OF ACCOMMODATION REQUIRED NOT LESS THAN SEVEN (7) DAYS BEFORE THE BID OPENING.

FOR: **Jefferson Parish Sheriff's Office
Warehouse Tornado Repairs
1801 Westbank Expressway
Harvey, LA 70058**

PROJECT NUMBER: **N-Y Associates Project Number 21023
JPSO Bid No. 23-JULY-1701**

Complete Bidding Documents may be obtained electronically online from:

**centralauctionhouse.com
or JPSO.com**

Bidding Documents can be reviewed only, upon request, at:

**N-Y Associates Inc.,
2750 Lake Villa Drive
Metairie, Louisiana 70002
Phone (504) 885-0500 ext. 113
Contact Person: Michael Buisson**

mbuisson@n-yassociates.com

Complete Bidding Documents may also be obtained from:

**N-Y Associates Inc.,
2750 Lake Villa Drive
Metairie, Louisiana 70002
Phone (504) 885-0500 ext. 113
Contact Person: Michael Buisson
mbuisson@n-yassociates.com**

upon deposit of \$ **200.00** for each set of documents. Deposit on the first two sets are fully refundable to all prime Bidders upon return of the documents, in good condition, no later than ten (10) days after receipt of bids. **Fifty percent** of the deposit of all other sets of documents will be refunded upon return of documents as stated above.

All Bids must be accompanied by bid security equal to five percent (5%) of the sum of the Base Bid and all Alternates, and must be in the form of a certified check, cashier's check or Owner's Bid Bond Form written by a surety company licensed to do business in Louisiana, signed by the surety's agency or attorney-in-fact. Surety must be listed on the current U.S. Department of the Treasury Financial Management Service list of approved bonding companies as approved for an amount equal to or greater than the amount for which it obligates itself in the Bond, or must be a Louisiana domiciled insurance company with at least an A - rating in the latest printing of the A.M. Best's Key Rating Guide. If surety qualifies by virtue of its Best's listing, the amount of the Bond may not exceed ten percent of policyholders' surplus as shown in the latest A.M. Best's Key Rating Guide. The Bid Bond shall be in favor of the Owner, and shall be accompanied by appropriate power of attorney. No Bid Bond indicating an obligation of less than five percent (5%) by any method is acceptable.

The successful Bidder shall be required to furnish a Performance Bond and a Payment Bond written by a company licensed to do business in Louisiana, in an amount equal to 100% of the Contract amount. Surety must be listed currently on the U. S. Department of Treasury Financial Management Service List (Treasury List) as approved for an amount equal to or greater than the contract amount, or must be an insurance company domiciled in Louisiana. If the Surety is not listed on the Treasury List, and has less than an "A"-rating (as shown in the latest edition of A.M. Best's Key Rating Guide) the maximum Contract amount for which that Surety may provide a Bond is \$500,000.00 (Five Hundred Thousand Dollars), or fifteen percent of the Surety's policyholders' surplus (as shown by Surety's most recent financial statements filed with the Louisiana Department of Insurance), whichever is less. If the Surety is not listed on the Treasury List, and has at least an "A"-rating or better (as shown in the latest edition of A.M. Best's Key Rating Guide), the maximum Contract amount for which that Surety may provide a Bond is fifteen percent of the Surety's policyholders' surplus (as shown by Surety's most recent financial statements filed with the Louisiana Department of Insurance). The Bond shall be signed by the surety's agent or attorney-in-fact, and shall be in favor of the Owner.

A MANDATORY PRE-BID CONFERENCE WILL BE HELD

at 10:00am on Thursday, June 29, 2023 at Jefferson Parish Sheriff's Office Warehouse Building, 1801 West Bank Expressway, Harvey, Louisiana 70053.

Attendance at this conference is MANDATORY and Bidders are advised that they will be required to state on the Bid Form that they have personally inspected and are familiar with the Project site located at **Jefferson Parish Sheriff's Office – Warehouse Building, 1801 Westbank Expressway, Harvey, Louisiana 70058.**

Bids shall be accepted from Contractors who are licensed under LA. R.S. 37:2150-2163 for the classification of **Building Construction**. Bidder is required to comply with provisions and requirements of LA. R.S.38:2212 (A)(1). No bid may be withdrawn for a period of thirty (30) days after receipt of bids, except under the provisions of LA. R.S. 38:2214.

The Owner reserves the right to reject any and all bids for just cause. In accordance with La. R.S. 38:2212 (A)(1)(b)(i), the provisions and requirements of this Section, those stated in the advertisement bids, and those required on the bid form shall not be considered as informalities and shall not be waived by any public entity.

INCORPORATION OF INSTRUCTIONS TO BIDDERS INTO ADVERTISEMENT FOR BIDS

The Instructions to Bidders contained in the Bid Documents (referenced above), and all requirements contained therein, are incorporated into this Advertisement for Bids as if completely set forth herein.

**JEFFERSON PARISH SHERIFF'S OFFICE
INSTRUCTIONS TO BIDDERS AND GENERAL CONDITIONS
PUBLIC WORKS/CONSTRUCTION PROJECTS**

Sealed bids will be received in the Jefferson Parish Sheriff's Purchasing Department, 1233 Westbank Expressway, Room 411, Harvey, Louisiana, 70058, until the date and hour specified on Page 1 of the enclosed Bid Proposal, at which time they will be publicly opened. **LATE BIDS WILL NOT BE ACCEPTED.**

All bids submitted are subject to these instructions and general conditions and any special conditions and specifications contained herein, all of which are made part of the bid proposal.

The purpose and intention of this invitation to bid is to afford all suppliers an equal opportunity to bid on all construction, maintenance, repair, operating supplies and/or equipment listed in this bid proposal. The Jefferson Parish Sheriff's Office will accept one bid only from each vendor. Items bid on must meet or exceed specifications outlined in the bid proposal.

Electronic Submittals of Bids

In accordance with LRS 38:2212 (1)(f) (i)), the Jefferson Parish Sheriff's Office also offers bidders the ability to respond to this bid electronically. Please visit our website at www.jpso.com, click on "Public Notices >Public Bids" and follow instructions.

A. To obtain bid documents electronically-You may go directly to our vendor's website at www.centralauctionhouse.com and click on "Click Here to View Listings" at the bottom of the page.

B. Official Bid Documents and Bid Specifications-Bid specifications are available in written or electronic form from the Sheriff's Office Purchasing Division, or its designated design professional (Architect/Engineer). To obtain the bid specifications in written form, you may contact the Sheriff's Purchasing Division at 504-363-5742. Or you may visit our website @www.jpso.com. Click on "Public Notices"> "Public Bids" and follow the instructions.

C. Submittal of Bid Responses-To submit a response to the bid, you may do so in written or electronic form. Responding in writing please submit the information located on the bidders checklist to the Sheriff's Purchasing Division by the date and time noted.

D. Submitting your bid response electronically-You may submit your bid response electronically with Central Bidding (our electronic bidding vendor).

Note: To participate in the electronic submittal of bids, our vendor requires that you register with them and pay a one-time registration fee. Please visit their website for details.

Proper Form and Authorization

ONLY BIDS WRITTEN IN INK OR TYPEWRITTEN, AND PROPERLY SIGNED BY A MEMBER OF THE FIRM OR AUTHORIZED REPRESENTATIVE, WILL BE ACCEPTED. PENCIL AND/OR PHOTOCOPIES OF SIGNATURE WILL DISQUALIFY BID.

Use of Brand Names and Stock Numbers

The product specifications set forth by this bid invitation are described and made pursuant to LRS 38:2212 (F)(1) and (2). Wherever in the specifications the name of a certain brand, make, manufacturer, or definite specification is utilized, it is only to denote the quality standard of product desired, and does not restrict bidders to the specific brand, make, manufacturer or specification name. The named brand, make, manufacturer or definite specification is utilized only to set forth and convey to prospective bidders general style, type, character, and quality of product desired. Equivalent products will be acceptable. If a bidder proposes to supply an equivalent product, then the bidder shall provide the name of the brand, make, manufacturer and complete product specifications with the bid submittal.

Licenses in Good Standing

All local and state Occupational and Sales Tax licenses must be in good standing.

Disclosure of Louisiana Contractor's License

In accordance with LRS 37:1250.1 and 37:2156.1, if the entire cost of the contract is \$50,000 or more, the contractor must be licensed by the State Licensing Board for Contractors and must indicate his Louisiana Contractor's License Number on the Bid Form and on the outside of the bid envelope for verification purposes.

Bid Bond

LRS 38:2218 requires all bids to be accompanied by bid security equal to five percent (5%) of the sum of the base bid and all alternates, and must be in the form of a certified check, cashier's check or a bid bond written by a surety company licensed to do business in Louisiana, signed by the surety's agency or attorney-in-fact. Surety must be listed on the current U.S. Department of the Treasury Financial Management Service list of approved bonding companies as approved for an amount equal to or greater than the amount for which it obligates itself in the Bond, or must be a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide. If surety qualifies by virtue of its Best's listing, the amount of the Bond may not exceed ten percent (10%) of the policyholders' surplus as shown in the latest A.M. Best's Key Rating Guide. The Bid Bond shall be in favor of the Jefferson Parish Sheriff's Office and shall be accompanied by appropriate power of attorney. No Bid Bond indicating an obligation of less than five percent (5%) by any method is acceptable.

Award of Contract

Every contract shall be awarded to "Lowest Responsible Bidder" (as defined by LRS 38:2216 (C) (2) (a)), taking into consideration the conformity with the bid proposal specifications and requirements that were advertised.

LRS 38:2215 allows forty-five (45) days for the award of said contract to the lowest responsible bidder. The lowest responsible bidder and the Sheriff's Office may, by mutually written consent, extend the deadline for award by one or more extensions of thirty calendar days.

Upon acceptance of your bid, LRS 38:2216 requires that a written contract be entered into by successful bidder and the Sheriff's Office. You will be required to submit a written contract to the Sheriff's Office for execution (unless it is agreed that the Sheriff's Office will provide the contract form). Within thirty (30) days of the execution of the contract, the Sheriff's Office will issue a notice to proceed. However, the notice to proceed can be extended upon mutual consent by both parties.

Right to Reject

The Jefferson Parish Sheriff's Office reserves the right to reject any and all bids in whole or in part and to waive any and all formalities in the best interest of the Jefferson Parish Sheriff's Office. LRS 38:2214 provides for the rejection of any and all bids for just cause.

LRS 38:2212.3 also allows the Sheriff's Office to reject the lowest bid if received from a bidder domiciled in a Communist country, or if the materials or supplies are manufactured in a Communist country, including but not limited to the Soviet Union, China, North Korea and Vietnam.

Non-discrimination

Bidders are not to exclude from participation in, deny the benefits of, or subject to discrimination under any program or activity, any person in the United States on the grounds of race, color, national origin, sex or religion except that any exemption from such prohibition against discrimination on the basis of religion as provided in the Civil Rights Acts of 1964, or Title VI and VII of the Act of April 11, 1968 shall also apply, as amended: nor discriminate on the basis of age under the Age Discrimination Act of 1975, as amended; nor with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973, as amended.

ANY PERSON REQUIRING SPECIAL ACCOMMODATIONS SHALL NOTIFY THE SHERIFF'S PURCHASING SECTION OF THE TYPE(S) OF ACCOMMODATION REQUIRED NOT LESS THAN SEVEN (7) DAYS BEFORE THE BID OPENING.

Davis-Bacon Act

If this project is being funded with Federal Funds, Bidders may be required to comply with the prevailing wage provisions of the Davis-Bacon Act. This typically applies on any construction project costing more than \$2,000, when 25 percent or more of the costs of such project is paid with Federal Funds.

Insurance Requirements

If you are the successful bidder, you will be required to provide Proof of Liability Insurance, if material and/or labor are included in the bid. You will also be required to provide Proof of Workmen's Compensation Insurance.

Prohibition of Cost-Plus Contracts

LRS 38:2221 prohibits the use of cost-plus contracts.

Errors or Omissions

LRS 38:2214 (C) allows for the withdrawal of bids that contain patently obvious, unintentional, or substantial mechanical, clerical or mathematical errors or omissions. The bidder may withdraw the bid if convincing sworn, written evidence of such errors is furnished to the Jefferson Parish Sheriff's Office within forty-eight (48) hours of the bid opening, excluding weekends and legal holidays. Any bidder who attempts to withdraw a bid under this provision will not be allowed to resubmit a bid under this Bid Proposal.

Performance Bonds

LRS 38:2216 provides that the successful bidder shall provide a good and solvent bond for the faithful performance of his duties. The successful bidder will be required to furnish a Performance and Payment Bond written by a company licensed to do business in Louisiana, in an amount equal to one-hundred percent (100%) of the Contract Amount. Surety must be listed on the current U.S. Department of the Treasury Financial Management Service list of approved bonding companies as approved for an amount equal to or greater than the contract amount, or must be an insurance company domiciled in Louisiana or owned by Louisiana residents. If surety is qualified other than by listing on the Treasury list, the contract amount may not exceed fifteen percent (15%) of policyholders' surplus as shown by surety's most recent financial statements filed with the Louisiana Department of Insurance and may not exceed the amount of \$500,000. However, a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide shall not be subject to the \$500,000 limitation, provided that the contract amount does not exceed ten percent (10%) of policyholders' surplus as shown in the latest in the latest A.M. Best's Key Rating Guide, nor fifteen percent (15%) of policyholders' surplus as shown by surety's most recent financial statements filed with the Louisiana Department of Insurance. The Bond shall inure solely to the benefit of the Jefferson Parish Sheriff's Office and must be signed by the surety's agent or attorney-in-fact. Failure to do so may result in the disqualification of the bidder.

A performance bond must be submitted within ten (10) days of being notified that you are the successful "Lowest Responsible Bidder".

Compliance with Bid Requirements

In accordance with LRS 38:2212 (A)(1)(b), the provisions and requirements of this sections, those stated in the advertisement for bids, and those required on the bid form shall not be considered as informalities and shall not be waived by any public entity.

Bidder's Checklist

Utilize the Jefferson Parish Sheriff's Office Bidders Checklist on page 5 of these instructions to ensure that your bid is in compliance with our requirements.

**JEFFERSON PARISH SHERIFF'S OFFICE
BIDDERS CHECK LIST**



CHECK OFF EACH LINE AS YOU COMPLETE INSTRUCTIONS:

- _____ Bidder has read the Instructions to Bidders and General Conditions.
- _____ Bidder has read the Bid Proposal and Specifications Sheet.
- _____ The **Louisiana Uniform Public Work Bid Form** is completed and signed in ink by authorized representative. **One (1) ORIGINAL BID and ONE (1) COPY of the Louisiana Uniform Public Work Bid Form** will be absolutely necessary as part of this bid requirement. The bid may not be considered if you fail to comply with this requirement. **(MUST BE INCLUDED WITH BID PACKET)**
- _____ A corporate resolution or other signature authorization is included, if someone other than a corporate officer signs for the Bidder/Contractor. **(MUST BE INCLUDED WITH BID PACKET)**
- _____ Bid Bond is included. **(MUST BE INCLUDED WITH BID PACKET)**
- _____ Bid proposal and required copies are sealed in an envelope.
- _____ Label is affixed to the outside of the bid envelope with required information below:

**Jefferson Parish Sheriff's Office
1233 Westbank Expressway, Room 411
Harvey, LA 70058**

**ATTN: Karen Leonard
Purchasing Department**

BID NUMBER: (JPSO Bid #)

**LOUISIANA STATE CONTRACTOR'S LICENSE NO.: XXXXXXXX
(provide LA State Contractor's License No.)**

**JEFFERSON PARISH SHERIFF'S OFFICE
BIDDERS CHECK LIST**



CHECK OFF EACH LINE AS YOU COMPLETE INSTRUCTIONS:

OTHER INFORMATION AND DOCUMENTS

The Jefferson Parish Sheriff requires other information and documents prior to the award of the bid to the successful "Lowest Responsible Bidder". This other information and documents must be provided to the Sheriff's Office within ten (10) days of the bidder being notified that he is the lowest bidder.

- _____ Bid Affidavit (see page 7 of instructions) has been signed and notarized.
- _____ Bidders Representation Form is signed and included.
- _____ Bidders Indemnification Agreement is signed and included.
- _____ Tax Identification Number (TIN) of the successful Bidder/Contractor/Joint-venture.
- _____ A Performance and Payment Bond issued in accordance with LRS 38:2216.

BID AFFIDAVIT

STATE OF LOUISIANA

PARISH OF JEFFERSON

BEFORE ME, the undersigned authority, personally came and appeared

_____, who after being by me duly sworn,

deposed and said that he is the fully authorized _____ of _____

(herein after referred to as bidder) the party who submitted a bid for _____

which bid was received by Jefferson Parish Sheriff's Office on _____ and said affiant further said:

(1) That bidder employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the bidder whose services in connection with the construction of the public building or project or in securing the public contract were in the regular course of their duties for bidder; and

(2) That no part of the contract price received by bidder was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the bidder whose services in connection with the construction of the public building or project were in the regular course of their duties for bidder.

(3) Said bid is genuine and the bidder has not colluded, conspired or agreed directly or indirectly with any other bidder to offer a sham or collusive bid.

(4) Said bidder has not in any manner directly or indirectly agreed with any other person to fix the bid price of affiant or any other bidder, or to fix any overhead profit or cost element of said bid price, or that of any other bidder, or to induce any other person to refrain from bidding.

(5) All statements contained in said bid are true and correct.

(6) Neither affiant nor any member of this company has divulged information regarding said bid or any data relative thereto to any other person, firm or corporation.

SWORN TO AND SUBSCRIBED

BEFORE ME THIS _____

DAY OF _____, 20_____

NOTARY PUBLIC

NOTICE TO VENDORS

1. **BID TABULATIONS WILL NOT BE GIVEN OVER THE TELEPHONE.**
2. **TAB SHEET WILL BE MAILED TO ANY VENDOR REQUESTING SAME, ONLY AFTER THE BID HAS BEEN AWARDED.**
3. **ALTHOUGH NOT MANDATORY, IT IS SUGGESTED THAT THE VENDOR OR A REPRESENTATIVE BE PRESENT AT BID OPENINGS.**
4. **ACCEPTANCE OF BIDS WILL BE DOCUMENTED BY THE TIME STAMP IN THE JEFFERSON PARISH SHERIFF'S PURCHASING DEPARTMENT. ANY BIDS THAT ARE DEEMED LATE BY THIS CLOCK WILL NOT BE ACCEPTED.**

THERE WILL BE NO EXCEPTIONS

LOUISIANA UNIFORM PUBLIC WORK BID FORM

**TO: Jefferson Parish Sheriff's Office
1233 Westbank Expressway
Harvey, LA 70053**

**BID FOR: Jefferson Parish Sheriff's Office
Warehouse Tornado Repairs
1801 Westbank Expressway
Harvey, LA 70058**

The undersigned bidder hereby declares and represents that she/he; a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by: **N-Y Associates Inc., 2750 Lake Villa Drive, Metairie, Louisiana 70002**, and dated **June 9, 2023**.

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following **ADDENDA:** (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging) _____

_____ Addendum #1 dated _____

_____ Addendum #2 dated _____

_____ Addendum #3 dated _____

_____ Addendum #4 dated _____

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated "Base Bid" * but not alternates) the sum of:

_____ Dollars (\$ _____)

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.

Alternate No. 1 (*Owner to provide description of alternate and state whether add or deduct*) for the lump sum of:

N/A _____ Dollars (\$ N/A _____)

Alternate No. 2 (*Owner to provide description of alternate and state whether add or deduct*) for the lump sum of:

N/A _____ Dollars (\$ N/A _____)

Alternate No. 3 (*Owner to provide description of alternate and state whether add or deduct*) for the lump sum of:

N/A _____ Dollars (\$ N/A _____)

NAME OF BIDDER: _____

ADDRESS OF BIDDER: _____

LOUISIANA CONTRACTOR'S LICENSE NUMBER: _____

NAME OF AUTHORIZED SIGNATORY OF BIDDER: _____

TITLE OF AUTHORIZED SIGNATORY OF BIDDER: _____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER **: _____

DATE: _____

* The Unit Price Form shall be used if the contract includes unit prices. Otherwise it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.

** If someone other than a corporate officer signs for the Bidder/Contractor, a copy of a corporate resolution or other signature authorization shall be required for submission of bid. Failure to include a copy of the appropriate signature authorization, if required, may result in the rejection of the bid unless bidder has complied with La. R.S. 38:2212(B)(5).

BID SECURITY in the form of a bid bond, certified check or cashier's check as prescribed by LA RS 38:2218.A is attached to and made a part of this bid.

LOUISIANA UNIFORM PUBLIC WORK BID FORM
UNIT PRICE FORM

TO: Jefferson Parish Sheriff's Office
1233 Westbank Expressway
Harvey, LA 70053

BID FOR: Jefferson Parish Sheriff's Office
Warehouse Tornado Repairs
1801 Westbank Expressway
Harvey, LA 70058

UNIT PRICES: This form shall be used for any and all work required by the Bidding Documents and described as unit prices. Amounts shall be stated in figures and only in figures.

DESCRIPTION:	<input type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (<i>Quantity times Unit Price</i>)

DESCRIPTION:	<input type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (<i>Quantity times Unit Price</i>)

DESCRIPTION:	<input type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (<i>Quantity times Unit Price</i>)

DESCRIPTION:	<input type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (<i>Quantity times Unit Price</i>)

DESCRIPTION:	<input type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (<i>Quantity times Unit Price</i>)

DESCRIPTION:	<input type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (<i>Quantity times Unit Price</i>)

DESCRIPTION:	<input type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (<i>Quantity times Unit Price</i>)

DESCRIPTION:	<input type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (<i>Quantity times Unit Price</i>)

Wording for "DESCRIPTION" is to be provided by the Owner.

All quantities are estimated. The contractor will be paid based upon actual quantities as verified by the Owner

DOCUMENT 00432

BID BOND

KNOW ALL MEN BY THESE PRESENTS that we, the undersigned,

as PRINCIPAL, and

as SURETY, are held and firmly bound unto the **Jefferson Parish Sheriff's Office**, hereinafter called the "OWNER", in the penal sum of:

DOLLARS (\$)) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying Bid dated _____, 20__, for

Jefferson Parish Sheriff's Office
Warehouse Tornado Repairs
1801 Westbank Expressway
Harvey, LA 70058

NOW, THEREFORE, if the Principal shall not withdraw said Bid within the period specified therein after the opening of the same or, if no period be specified, within forty-five (45) days after the said opening, and shall within the period specified therefore or, if no period be specified, within twelve (12) days after the prescribed forms are presented to him for signature, enter into a written Contract with the Sheriff's Office in accordance with the Bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such Contract; or in the event of the withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such bond within the time specified, if the Principal shall pay the Parish the difference between the amount specified in said Bid and the amount for which the Parish may procure the required work or supplies, or both, if the latter be in excess of the former, then the above obligation shall be void and of no effect, otherwise, to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under their several seals this _____ day of _____, 20__, the name and corporate seal of each corporate party being hereto affixed and these

presents signed by its undersigned representative, pursuant to authority of its governing body.

BID BOND (continued)

In Presence of:

(Individual Principal)

(Business Address, including Zip Code)

(Partnership)

(SEAL)

(Business Address, including Zip Code)

ATTEST:

BY: _____

(Corporate Principal)

(Business Address, including Zip Code)

BY: _____
AFFIX CORPORATE

SEAL

ATTEST:

(Corporate Surety)

(Business Address, including Zip Code)

CONSTRUCTION DOCUMENT 100% SUBMITTAL
JEFFERSON PARISH SHERIFF'S OFFICE
WAREHOUSE TORNADO REPAIRS

JUNE 9, 2023
N-Y JOB NO.: 21023

BY: _____
AFFIX CORPORATE SEAL

Countersigned:

BY: _____
Attorney-in-Fact*

State of _____

(SUCCESSFUL BIDDER MUST PROVIDE POST BID, IF APPLICABLE)

DOCUMENT 00440

CORPORATE RESOLUTION

EXCERPT FROM MINUTES OF MEETING OF THE BOARD OF DIRECTORS OF _____
_____ INCORPORATED.

AT THE MEETING OF DIRECTORS OF _____,
INCORPORATED, DULY NOTICED AND HELD ON _____, 2016 A
QUORUM BEING THERE PRESENT, ON MOTION DULY MADE AND SECONDED. IT WAS:

RESOLVED THAT _____, BE AND IS HEREBY
APPOINTED, CONSTITUTED AND DESIGNATED AS AGENT AND ATTORNEY-IN-FACT
OF THE CORPORATION WITH FULL POWER AND AUTHORITY TO ACT ON BEHALF OF
THIS CORPORATION IN ALL NEGOTIATIONS, BIDDING, CONCERNS AND
TRANSACTIONS WITH THE **JEFFERSON PARISH SHERIFF'S OFFICE** OR ANY OF ITS
AGENCIES, DEPARTMENTS, EMPLOYEES OR AGENTS, INCLUDING BUT NOT LIMITED
TO THE EXECUTION OF ALL BIDS, PAPERS, DOCUMENTS, AFFIDAVITS, BONDS,
SURETIES, CONTRACTS AND ACTS AND TO RECEIVE AND RECEIPT THEREFORE ALL
PURCHASE ORDERS AND NOTICES ISSUED PURSUENT TO THE PROVISIONS OF ANY
SUCH BID OR CONTRACT, THIS CORPORATION HEREBY RATIFYING, APPROVING,
CONFIRMING AND ACCEPTING EACH AND EVERY SUCH ACT PERFORMED BY SAID
AGENT AND ATTORNEY-IN- FACT.

I HEREBY CERTIFY THE FOREGOING TO BE A
TRUE AND CORRECT COPY OF AN EXCERPT OF
THE MINUTES OF THE ABOVE DATED MEETING OF
THE BOARD OF DIRECTORS OF SAID
CORPORATION, AND THE SAME HAS NOT BEEN
REVOKED OR RESCINDED.

SECRETARY-TREASURER

DATE

DOCUMENT 00456

NON-COLLUSION AFFIDAVIT

STATE OF LOUISIANA

JEFFERSON PARISH

AFFIDAVIT

BEFORE ME, the undersigned authority, duly commissioned and qualified within and for the state and parish aforesaid, personally came and appeared _____ representing _____ who, being by me first duly sworn deposed and said that he has read and signed this affidavit and does hereby agree under oath to comply with all provisions herein as follows and with the provisions of LA R.S. 38:2224, as amended:

(1) That affiant and his firm employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract for the above-referenced project with the Jefferson Parish Law Enforcement District One under which he will, if awarded the contract, receive or have received payment, other than persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties for affiant; and

(2) That no part of the contract price to be received or received by affiant or his firm was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the affiant whose services in connection with the construction of the public building or project were in the regular course of their duties for affiant.

signature. Bidder or representative to sign and type name below

Affiant

SWORN TO AND SUBSCRIBED BEFORE ME THIS _____ day of _____, 2_____.

NOTARY PUBLIC

AGREEMENT

THIS AGREEMENT, made the ____ day of _____, 20____ and signed on each of the dates set forth below, by and between Jefferson Parish Law Enforcement District, Jefferson Parish, Louisiana, referred to in these Contract Documents as "OWNER" acting on its own behalf and acting through its Chief Executive Officer Sheriff Joseph Lopinto (hereinafter the "Sheriff") and his authorized agents, duly authorized to act by virtue of Resolution No. _____, and (CONTRACTOR's legal name) referred to in these Contract Documents as "CONTRACTOR" (the "Agreement"):

WITNESSETH THAT:

WHEREAS, in accordance with law, OWNER has caused the Contract Documents to be prepared and an Invitation to Bid to be published for and in connection with the _____ Project (description) (the "Project");

WHEREAS, CONTRACTOR, in response to the Invitation to Bid, has submitted to OWNER, in the manner and at the time specified, a sealed bid in accordance with the Instructions to Bidders; and

WHEREAS, OWNER, in the manner prescribed by law, has publicly opened, examined, and canvassed the bids submitted, and has determined CONTRACTOR to be entitled to the award for the Work in accordance with the law and has duly awarded to CONTRACTOR a contract therefor, for the sum or sums named in CONTRACTOR's bid.

NOW THEREFORE, in consideration of the compensation to be paid to CONTRACTOR and of the mutual agreements herein contained, the parties to these presents have agreed and hereby agree, OWNER, for itself and its successors, and CONTRACTOR for itself, and its successors and assigns, as follows:

ARTICLE I.

A. OWNER, through the Chief Executive Officer Sheriff Joseph Lopinto of Jefferson Parish Law Enforcement District, by virtue of Resolution No _____, does hereby grant and confirm unto CONTRACTOR the Contract to perform the Work under the Project in accordance with the CONTRACTOR's written bid proposal dated _____, a copy of which is attached hereto and made a part hereof.

B. The CONTRACTOR shall perform all Work, including the assumption of all obligations, duties and responsibilities necessary to the successful completion of the Contract and the furnishing of all materials and equipment required to be incorporated in and to form a permanent part of the Work; tools, equipment, supplies, transportation, facilities, labor, superintendence and services required to perform the Work; and Bond, insurance and submittals; all as indicated or specified in the Contract Documents to be performed or furnished by CONTRACTOR for the Work included in and covered by OWNER's official award of this Contract to CONTRACTOR; such award being based on the acceptance by OWNER of CONTRACTOR's bid.

ARTICLE II.

The Project has been designed by N-Y Associates, Inc. who is hereinafter called ENGINEER and who is to act as OWNER's representative, to assume all duties and responsibilities and to have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE III.

A. All notices, letters, and other communications directed to OWNER shall be delivered or addressed and mailed (along with three copies), postage prepaid to the ENGINEER at the address in the Invitation to Bid, with four additional copies addressed and mailed to:

[person or position]
1233 Westbank Expressway
Harvey, Louisiana 70058

B. In addition, four copies of all correspondence directed to the ENGINEER shall be sent to the OWNER. The business address of CONTRACTOR given in this Agreement and CONTRACTOR's office in the vicinity of the Work are both hereby designated as the places to which all notices, letters, and other communications to CONTRACTOR will be mailed or delivered. CONTRACTOR shall notify ENGINEER and OWNER of any change of address immediately.

ARTICLE IV.

That OWNER shall pay to CONTRACTOR for performance of the Work embraced in this Contract, in accordance with the Contract Documents, and CONTRACTOR shall accept as full compensation therefor, the sum (subject to adjustment as provided in the Contract Documents) of _____ Dollars (\$_____) for all Work covered by and included in the Contract award and designated in the foregoing Article I; payment thereof to be made in current funds in the manner provided in the Contract Documents.

Notwithstanding anything to the contrary in the foregoing, CONTRACTOR acknowledges and agrees that, pursuant to the applicable Laws and Regulations, this Agreement is subject to an annual appropriation dependency requirement to the effect that the renewal and/or continuation of this Agreement is contingent upon the appropriation of funds to fulfill the requirements of the Agreement. If the OWNER fails to appropriate sufficient monies to provide for payments under this Agreement, the Agreement shall terminate on the last day of the last fiscal year for which funds were appropriated. This ground for termination is in addition to any other grounds that are identified in the General Conditions or the Supplementary Conditions.

As provided in Paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classification are to be made by ENGINEER as provided in Paragraph 9.08 of the General Conditions. Unit prices have been computed as provided in Paragraph 11.03.B of the General Conditions.

ARTICLE V.

The Work will be substantially completed within 275 days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions ("Substantial Completion"), and completed and ready for final acceptance in accordance with Paragraph 14.07.B. of the General Conditions within 45 days after the date of Substantial Completion. This time allocation allows for 73 days of lost production due to inclement weather.

ARTICLE VI.

A. OWNER and CONTRACTOR recognize and agree that time is of the essence of this Agreement and that the Work must be completed in every respect appropriate within the applicable time limits set forth in the Contract Documents, commencing from the date specified in the Contract Documents. OWNER and CONTRACTOR further understand and agree that it is difficult at this time to estimate the damage which the delay in completion of the Work would cause the OWNER and that, accordingly, if the CONTRACTOR shall neglect, fail, or refuse to complete the Work in accordance with the Contract Times specified in the Contract Documents, or any extension thereof granted by the OWNER in accordance with the applicable provisions of the Contract Documents then, in addition to the other stipulated damages provided for in Article VII below, the CONTRACTOR agrees, as a part of the consideration for the award of this Contract, that OWNER shall be entitled to receive the amount or amounts per day set forth in paragraph B below from CONTRACTOR, not as a penalty but as stipulated ("liquidated") damages for delay for such breach of contract, such amounts being specifically herein agreed upon in advance as the measure of damages to the OWNER on account of such delay in the completion of the Work.

B. The CONTRACTOR shall owe OWNER liquidated damages in the amount of five hundred dollars (\$500) for each and every calendar day after the time specified in Article V for Substantial Completion of the Work until the Work is determined to be substantially complete in accordance with the Contract Documents. After Substantial Completion, if the CONTRACTOR shall neglect, fail, or refuse to complete the Work within the time specified in Article V for final completion, or any proper extension thereof granted by the OWNER, CONTRACTOR shall owe OWNER liquidated damages in the amount of five hundred dollars (\$500) for each day after the time specified in Article V for final completion until the Work is determined to be finally completed in every respect in accordance with the Contract Documents.

C. The number of calendar days in default shall be calculated exclusive of the day on which the applicable completion time was specified and shall include each and every other calendar day up to and including the day that the CONTRACTOR has been determined to satisfy its obligation for the applicable degree of completion under the Contract Documents.

D. CONTRACTOR further agrees that the expiration of the Contract Time shall, ipso facto, constitute a putting in default where CONTRACTOR has failed to complete the Work in accordance with the applicable Contract Times, and OWNER need not formally place the CONTRACTOR in default, the CONTRACTOR hereby expressly waiving any and all notices of default.

E. CONTRACTOR agrees and consents that the liquidated damages may be deducted from progress payments payable to CONTRACTOR pursuant to the Contract Documents and that CONTRACTOR shall accept the Contract Price, reduced by the aggregate amount of the liquidated damages so deducted, in full satisfaction of all Work executed under the Contract Documents.

ARTICLE VII.

In addition to and not in lieu of the liquidated damages provided above, OWNER shall also be entitled to recover from CONTRACTOR or CONTRACTOR's Surety additional liquidated damages arising out of the breach of contract for delay in completion of the Work in accordance with the Contract Times for the same amount of time calculated pursuant to ARTICLE VI above. These additional liquidated damages, the amounts of each of which are applicable to the Contract having been set forth in the Supplementary Conditions, may include, but are not limited to:

- (1) Extended architectural and/or engineering fees \$_____;
 - (2) Extended Resident Project Representative fees \$_____;
 - (3) Extended construction management fees \$_____;
 - (4) Extended OWNER'S overhead and personnel expenses \$_____;
- and
- (5) Owner's other costs directly related to the delay in completion beyond the Contract Times.

CONTRACTOR agrees and consents that the additional liquidated damages may be deducted from progress payments payable to CONTRACTOR pursuant to the Contract Documents and that CONTRACTOR shall accept the Contract Price, reduced by the aggregate amount of the additional liquidated damages so deducted, in full satisfaction of all Work executed under the Contract Documents.

ARTICLE VIII.

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment as recommended by ENGINEER, as provided below. All such payments will be measured by the schedule of values established pursuant to Paragraph 2.07 of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.

Upon receipt of the Final Application for Payment, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in Paragraph 14.07.C.3. of the General Conditions and any relevant Supplementary Conditions.

Pursuant to LSA-R.S. 38:2248, OWNER shall retain the following percentages of each progress payment until payment is due under the terms and conditions governing retainage payment:

<u>CONTRACT AMOUNT</u>	<u>RETAINAGE</u>
\$0 - \$499,999.99	10%
\$500,000 or greater	5%

ARTICLE IX.

The Contract Documents, which comprise the agreement between OWNER and CONTRACTOR, concerning the Work, consist of the documents listed in the Table of Contents, if any, and the documents identified below:

1. This Agreement (pages 1 to ____, inclusive).
2. Exhibits to this Agreement (pages ____ to ____, inclusive).
3. Performance, Payment, and other Bonds, consisting of ____ pages.
4. Notice to Proceed (not attached).
5. General Conditions (pages ____ to ____, inclusive).
6. Supplementary Conditions (pages ____ to ____, inclusive).
7. Specifications bearing the title _____ and consisting of ____ divisions and ____ pages.
8. Drawings consisting of a cover sheet and sheets numbered ____ through ____, inclusive with each sheet bearing the following general title: _____.
9. Addenda numbers ____ to ____, inclusive
10. CONTRACTOR's Bid (pages ____ to ____, inclusive).
11. Documentation submitted by CONTRACTOR prior to Notice of Award: (pages ____ to ____ inclusive).
12. The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying or supplementing the Contract Documents pursuant to Paragraph 3.04 of the General Conditions.

The documents listed above are attached to this Agreement (except as expressly noted otherwise above).

ARTICLE X.

In order to induce OWNER to enter into this Agreement, the CONTRACTOR makes the following representations:

1. CONTRACTOR has visited the Site, has familiarized himself with and is satisfied as to the nature and extent of the Contract Documents, Work, locality, and as to all general, local and Site conditions and federal, state, and local Laws, and Regulations, which may affect cost, progress, performance or furnishing of the Work.
2. CONTRACTOR has examined and carefully studied the Contract Documents (including the Addenda listed in Article IX) and the other related data identified in the Bidding Documents including "technical data."
3. CONTRACTOR has carefully studied all (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface

structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02.A. of the General Conditions and (2) reports and drawings of a Hazardous Environmental Condition, if any, at the Site which has been identified in the Supplementary Conditions as provided in Paragraph 4.02.A. of the General Conditions. CONTRACTOR accepts the determination set forth in Paragraph SC-4.02 of the Supplementary Conditions of the extent of the "technical data" contained in such reports and drawings upon which CONTRACTOR is entitled to rely as provided in Paragraph 4.02 of the General Conditions. CONTRACTOR acknowledges that such reports and drawings are not Contract Documents and may not be complete for CONTRACTOR's purpose. CONTRACTOR acknowledges that OWNER and ENGINEER do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Contract Documents with respect to Underground Facilities at or contiguous to the Site. CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all such additional supplementary examinations, investigations, explorations, test, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto. CONTRACTOR does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the performance and furnishing of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.

4. CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.
5. CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.
6. CONTRACTOR has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR, and the Contract Documents are generally sufficient to indicate and convey an understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE XI.

Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions unless otherwise defined herein or the context otherwise requires.

No assignment, sublet or transfer by a party hereto of any rights under or interest in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), nor without the consent of the surety unless the surety has waived its right to notice of assignment and, unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

OWNER and CONTRACTOR each binds itself, its partners, successors, assigns, legal representatives, sureties, or guarantors, if any, to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

This Agreement shall be deemed to be a contract made under the laws of the State of Louisiana, and for all purposes shall be interpreted in its entirety in accordance with the laws of said State. The CONTRACTOR hereby agrees and consents to the jurisdiction of the courts of the State of Louisiana over its person. The parties hereto agree that the sole and exclusive venue of any suit or proceeding brought pursuant to this Agreement shall be the 24th Judicial District Court for the Parish of Jefferson, State of Louisiana.

Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first above written, signed by each on each of the dates set forth below, in the presence of the undersigned witnesses and each signatory warrants by its signature that it has the appropriate authority to sign this Agreement.

(CONTRACTOR)

By: _____ (SEAL & ATTEST)

Title: _____

Witness

Date: _____

Address for giving notices:

Witness

License No. _____

JEFFERSON PARISH LAW ENFORCEMENT DISTRICT
(OWNER)

By: _____ (SEAL & ATTEST)

Chief Executive Officer
Jefferson Parish Law Enforcement District

Date: _____

Witness

Witness

SECTION 00615
PERFORMANCE BOND AND PAYMENT BOND

- A. Performance Bond: The Performance Bond and Payment Bond Forms to be used for this Contract for Construction shall be provided on the following:

END OF DOCUMENT

FORM OF PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, a _____,
(Name of Contractor)

hereinafter called "Principal", and _____, State
(Surety)

of _____, hereinafter called the "Surety", are held and firmly bound unto
_____, of _____,
(Owner) (City and State)

hereinafter called "Owner", in the penal sum of _____
Dollars (\$) in lawful money of the United States, for the payment of which sum
well and truly to be made, we bind ourselves, our heirs, executors, administrators, and
successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that Whereas, the Principal entered
into a certain contract with the Owner, dated the _____ day of _____,
200__, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all
the undertakings, covenants, terms, conditions, and agreements of said contract during the
original term thereof, and any extensions thereof which may be granted by the Owner, with or
without notice to the Surety, and if he shall satisfy all claims and demands incurred under such
contract, and shall fully indemnify and save harmless the Owner from all costs and damages
which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all

FORM OF PERFORMANCE BOND (continued)

outlay and expense which the Owner may incur in making good any default in connection with the construction of such work, and all insurance premiums on said work, whether by sub-contractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of which shall be deemed an original, this the _____ day of _____.

WITNESSES:

(Principal)

Title: _____

(Surety)

By: _____

(Attorney-in-fact)

(Address)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute bond.

LABOR AND MATERIALS PAYMENT BOND

KNOW ALL MEN BY THESE PRESENT: that

(Name of Contractor)

(Address of Contractor)

a _____ hereinafter called Principal,

and _____
(Name of Surety)

(Address of Surety)

hereinafter called Surety, all held and firmly bound unto the Parish of Jefferson hereinafter called Owner, in the penal sum of _____ Dollar (\$) in lawful money of the United States, for the payment of which sum well and truly be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 200__, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

LABOR AND MATERIALS PAYMENT BOND (Continued)

PROVIDED, FURTHER, that the said Surety, for the value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or to the specifications accompanying the same shall in anywise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the specifications.

PROVIDED, FURTHER, that no final settlement between Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each of which shall be deemed an original, this _____ day of _____,

ATTEST:

Principal

BY: _____

ADDRESS: _____

(SEAL)

Witness at to Principal

Address

ATTEST:

Surety

BY: _____

ADDRESS: _____

(SEAL)

Address

NOTE: DATE OF BOND must not be prior to date of Contract:

1. Correct Name of Contractor
2. A Corporation, A Partnership, or an Individual
3. Correct Name of Surety

SECTION 00650

STANDARD
GENERAL CONDITIONS
OF THE
CONSTRUCTION CONTRACT
Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and
Issued and Published Jointly By
[INSERT LOGOS]

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

AMERICAN CONSULTING ENGINEERS COUNCIL

AMERICAN SOCIETY OF CIVIL ENGINEERS

This document has been approved and endorsed by

The Associated General [seal] Contractors of America

Construction Specifications Institute

[seal]

EJCDC No. 1910-8 (1996 Edition)

Copyright ©1996

National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314

American Consulting Engineers Council
1015 15th Street N.W., Washington, DC 20005

American Society of Civil Engineers
345 East 47th Street, New York, NY 10017

TABLE OF CONTENTS

	<u>Page</u>
ARTICLE 1 - DEFINITIONS AND TERMINOLOGY	5
1.01 <i>Defined Terms</i>	5
1.02 <i>Terminology</i>	9
ARTICLE 2 - PRELIMINARY MATTERS	10
2.01 <i>Delivery of Bonds</i>	10
2.02 <i>Copies of Documents</i>	10
2.03 <i>Commencement of Contract Times; Notice to Proceed</i>	10
2.04 <i>Starting the Work</i>	10
2.05 <i>Before Starting Construction</i>	10
2.06 <i>Preconstruction Conference</i>	12
2.07 <i>Initial Acceptance of Schedules</i>	12
ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE	12
3.01 <i>Intent</i>	12
3.02 <i>Reference Standards</i>	13
3.03 <i>Reporting and Resolving Discrepancies</i>	13
3.04 <i>Amending and Supplementing Contract Documents</i>	14
3.05 <i>Reuse of Documents</i>	14
ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS	14
4.01 <i>Availability of Lands</i>	14
4.02 <i>Subsurface and Physical Conditions</i>	15
4.03 <i>Differing Subsurface or Physical Conditions</i>	15
4.04 <i>Underground Facilities</i>	16
4.05 <i>Reference Points</i>	17
4.06 <i>Hazardous Environmental Condition at Site</i>	18
ARTICLE 5 - BONDS AND INSURANCE	19
5.01 <i>Performance, Payment, and Other Bonds</i>	19
5.02 <i>Licensed Sureties and Insurers</i>	21
5.03 <i>Certificates of Insurance</i>	21
5.04 <i>CONTRACTOR's Liability Insurance</i>	21
5.05 <i>OWNER's Liability Insurance</i>	25
5.06 <i>Property Insurance</i>	25
5.07 <i>Waiver of Rights</i>	27
5.08 <i>Receipt and Application of Insurance Proceeds</i>	27
5.09 <i>Acceptance of Bonds and Insurance; Option to Replace</i>	28
5.10 <i>Partial Utilization, Acknowledgment of Property Insurer</i>	28
ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES	28
6.01 <i>Supervision and Superintendence</i>	28
6.02 <i>Labor; Working Hours</i>	29
6.03 <i>Services, Materials, and Equipment</i>	29
6.04 <i>Progress Schedule</i>	30
6.05 <i>Substitutes and "Or-Equals"</i>	30
6.06 <i>Concerning Subcontractors, Suppliers, and Others</i>	32
6.07 <i>Patent Fees and Royalties</i>	34
6.08 <i>Permits</i>	34
6.09 <i>Laws and Regulations</i>	34

6.10	<i>Taxes</i>	35
6.11	<i>Use of Site and Other Areas</i>	35
6.12	<i>Record Documents</i>	35
6.13	<i>Safety and Protection</i>	36
6.14	<i>Safety Representative</i>	36
6.15	<i>Hazard Communication Programs</i>	36
6.16	<i>Emergencies</i>	36
6.17	<i>Shop Drawings and Samples</i>	37
6.18	<i>Continuing the Work</i>	38
6.19	<i>CONTRACTOR's General Warranty and Guarantee</i>	38
6.20	<i>Indemnification</i>	39
ARTICLE 7 -	OTHER WORK	40
7.01	<i>Related Work at Site</i>	40
7.02	<i>Coordination</i>	41
ARTICLE 8 -	OWNER'S RESPONSIBILITIES	41
8.01	<i>Communications to Contractor</i>	41
8.02	<i>Replacement of ENGINEER</i>	41
8.03	<i>Furnish Data</i>	41
8.04	<i>Pay Promptly When Due</i>	41
8.05	<i>Lands and Easements; Reports and Tests</i>	41
8.06	<i>Insurance</i>	41
8.07	<i>Change Orders</i>	41
8.08	<i>Inspections, Tests, and Approvals</i>	42
8.09	<i>Limitations on OWNER's Responsibilities</i>	42
8.10	<i>Undisclosed Hazardous Environmental Condition</i>	42
8.11	<i>Evidence of Financial Arrangements</i>	42
ARTICLE 9 -	ENGINEER'S STATUS DURING CONSTRUCTION	42
9.01	<i>OWNER'S Representative</i>	42
9.02	<i>Visits to Site</i>	42
9.03	<i>Project Representative</i>	43
9.04	<i>Clarifications and Interpretations</i>	43
9.05	<i>Authorized Variations in Work</i>	43
9.06	<i>Rejecting Defective Work</i>	43
9.07	<i>Shop Drawings, Change Orders and Payments</i>	43
9.08	<i>Determinations for Unit Price Work</i>	44
9.09	<i>Decisions on Requirements of Contract Documents and Acceptability of Work</i>	44
9.10	<i>Limitations on ENGINEER's Authority and Responsibilities</i>	44
ARTICLE 10 -	CHANGES IN THE WORK; CLAIMS	45
10.01	<i>Authorized Changes in the Work</i>	45
10.02	<i>Unauthorized Changes in the Work</i>	45
10.03	<i>Execution of Change Orders</i>	45
10.04	<i>Notification to Surety</i>	46
10.05	<i>Claims and Disputes</i>	46
ARTICLE 11 -	COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK	47
11.01	<i>Cost of the Work</i>	47
11.02	<i>Cash Allowances</i>	49
11.03	<i>Unit Price Work</i>	50
ARTICLE 12 -	CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES	50
12.01	<i>Change of Contract Price</i>	50
12.02	<i>Change of Contract Times</i>	51

12.03	<i>Delays Beyond CONTRACTOR's Control</i>	52
12.04	<i>Delays Within CONTRACTOR's Control</i>	52
12.05	<i>Delays Beyond OWNER's and CONTRACTOR's Control</i>	52
12.06	<i>Delay Damages</i>	52
ARTICLE 13 -	TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK	53
13.01	<i>Notice of Defects</i>	53
13.02	<i>Access to Work</i>	53
13.03	<i>Tests and Inspections</i>	53
13.04	<i>Uncovering Work</i>	54
13.05	<i>OWNER May Stop the Work</i>	54
13.06	<i>Correction or Removal of Defective Work</i>	54
13.07	<i>Correction Period</i>	55
13.08	<i>Acceptance of Defective Work</i>	55
13.09	<i>OWNER May Correct Defective Work</i>	56
ARTICLE 14 -	PAYMENTS TO CONTRACTOR AND COMPLETION	56
14.01	<i>Schedule of Values</i>	56
14.02	<i>Progress Payments</i>	56
14.03	<i>CONTRACTOR's Warranty of Title</i>	60
14.04	<i>Substantial Completion</i>	60
14.05	<i>Partial Utilization</i>	61
14.06	<i>Final Inspection</i>	62
14.07	<i>Final Payment</i>	62
14.08	<i>Final Completion Delayed</i>	63
14.09	<i>Waiver of Claims</i>	63
ARTICLE 15 -	SUSPENSION OF WORK AND TERMINATION	63
15.01	<i>OWNER May Suspend Work</i>	63
15.02	<i>OWNER May Terminate for Cause</i>	64
15.03	<i>OWNER May Terminate For Convenience</i>	64
15.04	<i>CONTRACTOR May Stop Work or Terminate</i>	65
ARTICLE 16 -	DISPUTE RESOLUTION	65
16.01	<i>Methods and Procedures</i>	65
ARTICLE 17 -	MISCELLANEOUS	65
17.01	<i>Giving Notice</i>	65
17.02	<i>Computation of Times</i>	65
17.03	<i>Cumulative Remedies</i>	66
17.04	<i>Survival of Obligations</i>	66
17.05	<i>Controlling Law</i>	66
EXHIBIT A -	Duties, Responsibilities and Limitations of Authority of Resident Project Representative	67

GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Contract Documents and printed with initial or all capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. To the extent capitalized terms defined in AIA Document A201-2007, are used in the Contract Documents, those terms shall have the same meaning as their corresponding term below, e.g., Contract Sum = Contract Price, Contract Time = Contract Times, Construction Change Directive = Work Change Directive.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between OWNER and CONTRACTOR covering the Work.

3. *Application for Payment*--The form acceptable to ENGINEER which is to be used by CONTRACTOR during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

7. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, Bid security form, if any, and the Bid form with any supplements.

8. *Bonds*--Performance and payment bonds and other instruments of security.

9. *Change Order*--A document recommended by ENGINEER which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, subject to and in accordance with the applicable Laws and Regulations issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by OWNER or CONTRACTOR seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the OWNER and CONTRACTOR concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*--The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to

Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and ENGINEER's written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by OWNER to CONTRACTOR are not Contract Documents.

13. *Contract Price*--The moneys payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.03 in the case of Unit Price Work).

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

15. *CONTRACTOR*--The individual or entity with whom OWNER has entered into the Agreement.

16. *Cost of the Work*--See paragraph 11.01.A for definition.

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

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

19. *ENGINEER*--The individual or entity named as such in the Agreement.

20. *ENGINEER's Consultant*--An individual or entity having a contract with ENGINEER to furnish services as ENGINEER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

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

22. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

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

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

25. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

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

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

28. *Notice of Award*--The written notice by OWNER to the apparent successful bidder stating that upon timely compliance by the apparent successful bidder with the conditions precedent listed therein, OWNER, if OWNER decides to proceed with the Work, will sign and deliver the Agreement to the successful bidder. However, the Notice of Award shall not be construed as an agreement, meeting of the minds, contract, or any other legal obligation between the OWNER and CONTRACTOR. Until the CONTRACTOR receives a Notice to Proceed from the OWNER, the CONTRACTOR has no right or remedy against the OWNER.

29. *Notice to Proceed*--A written notice given by OWNER to CONTRACTOR (with a copy to ENGINEER) fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR's obligations and the Work under the Contract Documents.

30. *OWNER*--The individual, entity, public body, or authority with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be performed.

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

32. *PCBs*--Polychlorinated biphenyls.

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

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

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

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

37. *Resident Project Representative*--The authorized representative of ENGINEER, OWNER, or an independent contractor who may be assigned to the Site or any part thereof.

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

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

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

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

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

43. *Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER, as evidenced by ENGINEER's issued and signed definitive Certificate of Substantial Completion, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

44. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

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

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

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

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

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

50. *Written Amendment*--A written statement modifying the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly construction-related aspects of the Contract Documents.

1.02 *Terminology*

A. *Intent of Certain Terms or Adjectives*

1. Whenever in the Contract Documents the terms “as allowed,” “as approved,” or terms of like effect or import are used, or the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of ENGINEER as to the Work, it is intended that such action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.10 or any other provision of the Contract Documents.

B. *Day*

1. The word “day” shall constitute a calendar day of 24 hours measured from midnight to the next midnight. Any reference to the word “day” in combination with other words such as “workday” or “non-work day” shall be considered to be a reference to a calendar day.

C. *Defective*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.04 or 14.05).

D. *Furnish, Install, Perform, Provide*

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

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

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

4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of CONTRACTOR, “provide” is implied.

E. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry

or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS AND CERTIFICATES OF INSURANCE

2.01 Delivery of Bonds

A. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish. CONTRACTOR shall also deliver to the OWNER, with copies to each additional insured identified herein or in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which OWNER or any additional insured may reasonably request) which CONTRACTOR is required to purchase and maintain in accordance with paragraph 5.04.

2.02 Copies of Documents

A. OWNER shall furnish to CONTRACTOR ~~up to ten~~ six copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed

A. ~~The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier. The Contract Times will commence to run on the day indicated in the Notice to Proceed. The OWNER shall issue a Notice to Proceed in accordance with La. R.S. 38:2215. In no event will OWNER have any obligations or duties to CONTRACTOR under the~~

Agreement until the Notice to Proceed is given to CONTRACTOR. In no event will the Contract Times commence to run later than the one hundred twentieth day after the day of Bid opening or the thirtieth day after the Effective Date of Agreement, whichever date is later, unless the parties otherwise agree.

2.04 Starting the Work

A. CONTRACTOR shall start to perform the Work ~~on~~ within ten days from the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 Before Starting Construction

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

The grades, elevations, dimensions, locations, and field measurements or any drawings or specifications issued by the ENGINEER, or the Work installed by other contractors, are not guaranteed by the ENGINEER or the OWNER. Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify the accuracy of all grades, elevations, dimensions, locations, and field measurements. In all cases of the

interconnection of Work with existing or other Work, CONTRACTOR shall verify at the Site all dimensions relating to such existing or other Work. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error, ambiguity, or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby. Any errors due to the CONTRACTOR's failure to verify all such grades, elevations, locations, dimensions, or field measurements shall be promptly rectified by CONTRACTOR without any additional costs to OWNER or extensions of Contract Times.

B. *Preliminary Schedules:* Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for its timely review:

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

2. a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing, and processing such submittal; and

3. a preliminary schedule of values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

4. The construction progress schedule shall be in a detailed precedence-style critical path method (CPM) or prima vera type format

satisfactory to the OWNER and the ENGINEER, and shall also: (1) provide a graphic representation of all activities and events that will occur during the performance of the Work; (2) identify each phase of construction and occupancy; and (3) set forth dates that are critical in insuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents (hereinafter referred to as Milestones). Upon review and acceptance by the OWNER and the ENGINEER of the Milestones, the construction schedule shall be deemed part of the Contract. If not accepted, the construction schedule shall be promptly revised by the CONTRACTOR in accordance with the recommendations of the OWNER and the ENGINEER and resubmitted for acceptance

~~C. Evidence of Insurance: —Before any Work at the Site is started, CONTRACTOR and OWNER shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which CONTRACTOR and OWNER respectively are required to purchase and maintain in accordance with Article 5.~~

CONTRACTOR shall not start any Work at the Site unless and until CONTRACTOR has in place and in full force and effect all of the insurance and Bonds which the CONTRACTOR is required to obtain by the Agreement, the Contract, or the Supplementary Conditions. Any delay in obtaining confirmation of the existence of the insurance, Bonds, and other security required by this Contract and compliance with the terms of the Contract therefor shall be counted as days against the Contract Times if the start of Work is delayed beyond the time set forth in paragraph 2.04.A. The Contract shall not be in force or binding on OWNER until satisfactory Bonds and insurance have

been provided in accordance with the Contract Documents.

D. In accordance with the Instructions to Bidders, one complete copy of the executed Contract Documents, including Specifications and Drawings, shall be filed with the Clerk of Court and Ex-Officio Recorder of Mortgages for Jefferson Parish promptly, but in any event before starting any Work, at CONTRACTOR'S expense, which expense may be deducted from any application for payment if not paid for directly by CONTRACTOR.

2.06 *Preconstruction Conference*

~~A. Within 20 days after~~ After the Effective Date of the Agreement and prior to the time the Contract Times start to run, but and before any Work at the Site is started, a conference attended by CONTRACTOR, OWNER, ENGINEER, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.05.B, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

A. Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to review for acceptability to ENGINEER as provided below the schedules submitted in accordance with paragraph 2.05.B. CONTRACTOR shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until acceptable schedules are submitted to ENGINEER.

1. The progress schedule will be acceptable to ENGINEER if it provides an

orderly progression of the Work to completion within any specified Milestones and the Contract Times. Such acceptance will not impose on ENGINEER responsibility for the progress schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor.

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

3. CONTRACTOR's schedule of values will be acceptable to ENGINEER as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to OWNER.

C. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in Article 9.

D. In the event of an inconsistency in the Contract Documents, the order of precedence shall be as follows:

- A. Agreement
- B. Addenda/Change Orders/Written Amendment
- C. CONTRACTOR's Bid
- D. Supplementary Conditions
- E. General Conditions
- F. Invitation to Bid
- G. Instructions to Bidders
- H. Specifications
- I. Referenced Standard Specifications
- J. Drawings

With reference to the Drawings, the order of precedence is as follows: Figures govern over scaled dimensions; detail drawings over general drawings; addenda/change order drawings govern over standard drawings and shop drawings.

E. OWNER makes no warranties, express or implied, with respect to the fitness of the Drawings or Specifications prepared by the ENGINEER or any other person, and CONTRACTOR waives any claims against OWNER arising out of any implied or express warranties of the fitness of the Drawings or Specifications for their intended purpose.

3.02 Reference Standards

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

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

3.03 Reporting and Resolving Discrepancies

A. Reporting Discrepancies

1. If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, CONTRACTOR shall report it to ENGINEER in writing at once. CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as required by paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in paragraph 3.04; provided, however, that CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any such conflict, error, ambiguity, or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.

B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in

resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

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

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

3.04 *Amending and Supplementing Contract Documents*

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

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways: (i) a Field Order; (ii) ENGINEER's approval of a Shop Drawing or Sample; or (iii) ENGINEER's written interpretation or clarification. Any variations and deviations in the Work arising from any of the methods set forth in paragraph 3.04.B. will not authorize an amendment to the Contract Price or Contract Times. The only methods to amend the Contract Price or Contract Times are by a Written Amendment or a Change Order.

3.05 *Reuse of Documents*

A. CONTRACTOR and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with OWNER: (i) shall not have or acquire any title to or ownership rights in any of the Drawings,

Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER or ENGINEER's Consultant, including electronic media editions; and (ii) shall not reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adoption by ENGINEER. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude CONTRACTOR from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. OWNER shall furnish the Site. OWNER shall notify CONTRACTOR of any encumbrances or restrictions not of general application but specifically related to use of the Site with which CONTRACTOR must comply in performing the Work. OWNER will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If CONTRACTOR and OWNER are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in OWNER's furnishing the Site, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

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

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

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that ENGINEER has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that ENGINEER has used in preparing the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER, or any of ENGINEER's Consultants with respect to:

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

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

F. The CONTRACTOR and each Subcontractor shall evaluate and satisfy themselves as to the Site conditions and limitations under which the Work is to be performed, including, without limitation, (1) the location, condition, layout, and nature of the Project Site and surrounding areas; (2) generally prevailing climactic conditions; (3) anticipated labor, supply, and costs; (4) availability and cost of materials, tools, and equipment; and (5) other similar issues. The OWNER assumes no responsibility or liability for the physical condition or safety of the Project Site or any improvements located on the Project Site. Except as set forth in Article 4, the CONTRACTOR shall be solely responsible for providing a safe place for the performance of the Work. The OWNER shall not be required to make adjustments in either the Contract Price or Contract Times arising from a failure by the CONTRACTOR or any Subcontractor to comply with the requirements of this paragraph.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If CONTRACTOR believes discovers or should have discovered that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which CONTRACTOR is entitled to rely as provided in paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then CONTRACTOR shall, ~~promptly after becoming aware thereof~~ immediately and in any event within 48 hours after the time the CONTRACTOR discovers and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), notify OWNER and ENGINEER in writing about such condition. CONTRACTOR shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *ENGINEER's Review:* After receipt of written notice as required by paragraph 4.03.A, ENGINEER will promptly review the pertinent condition, determine the necessity of OWNER's obtaining additional exploration or tests with respect thereto, and advise OWNER in writing (with a copy to CONTRACTOR) of ENGINEER's findings and conclusions.

C. *Possible Price and Times Adjustments*

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

a. such condition must meet any one or more of the categories described in paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of paragraphs 9.08 and 11.03.

2. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Contract Times if:

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

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

c. CONTRACTOR failed to give the written notice within the time and as required by paragraph 4.03.A.

3. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in paragraph 10.05. However, OWNER, ENGINEER, and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the

Site is based on information and data furnished to OWNER or ENGINEER by the owners of such Underground Facilities, including OWNER, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and CONTRACTOR shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including OWNER, during construction, and

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

B. Not Shown or Indicated

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, CONTRACTOR shall, immediately and in any event within 24 hours after CONTRACTOR discovers ~~promptly after becoming aware thereof~~ and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility

and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility.

2. If ENGINEER concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued prepared for the OWNER's consideration to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price of Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, OWNER or CONTRACTOR may make a Claim therefor as provided in paragraph 10.05. However, OWNER, ENGINEER, and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses, or damages incurred or sustained by CONTRACTOR on or in connection with any other project or anticipated project.

4.05 Reference Points

A. OWNER ENGINEER shall provide engineering surveys to establish reference points for construction which in ENGINEER's judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no

changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the ENGINEER in the preparation of the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER or any of ENGINEER's Consultants with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
3. any CONTRACTOR interpretation of or conclusion drawn from any "technical

data" or any such other data, interpretations, opinions or information.

~~C. CONTRACTOR shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. CONTRACTOR shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible.~~

CONTRACTOR must take all precautions to discover and locate any Hazardous Environmental Condition at the Site that may present a substantial danger to persons or property exposed thereto in connection with the Work at the Site. CONTRACTOR shall be responsible for any damages arising out of or caused by a Hazardous Environmental Condition created on the Site by CONTRACTOR, a Subcontractor, Supplier, or anyone else for whom CONTRACTOR is responsible. Within 24 hours of the time CONTRACTOR discovers the Hazardous Environmental Condition, CONTRACTOR shall follow the procedures set forth in paragraph 4.06.D.

D. If CONTRACTOR encounters a Hazardous Environmental Condition or if CONTRACTOR or anyone for whom CONTRACTOR is responsible creates a Hazardous Environmental Condition, CONTRACTOR shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by paragraph 6.16); and (iii) notify OWNER and ENGINEER (and promptly thereafter confirm such notice in writing). OWNER shall promptly consult with ENGINEER concerning the necessity for OWNER to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. CONTRACTOR shall not be required to resume Work in connection with such condition or in any affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by CONTRACTOR, either party may make a Claim therefor as provided in paragraph 10.05.

~~F. If after receipt of such written notice CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in paragraph 10.05. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others in accordance with Article 7.~~

~~G. To the fullest extent permitted by Laws and Regulations, OWNER shall indemnify and hold harmless CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals~~

~~and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing in this paragraph 4.06.E shall obligate OWNER to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.~~

H. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing in this paragraph 4.06.F shall obligate CONTRACTOR to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of paragraphs 4.02, 4.03, and 4.04 are not intended to apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. CONTRACTOR shall purchase and furnish performance and payment Bonds, each in an amount at least equal to 100 percent of the Contract Price including, but

not limited to, the obligations for actual damages and liquidated damages in accordance with the provisions in the Agreement regarding delay in completion of the Work within the Contract Times as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Contract Documents.

B. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed only by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury meeting the requirements set forth in La. R.S. 38:2218 and 2219 and any other requirements and qualifications set forth in the Supplementary Conditions. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

C. If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.01.B, CONTRACTOR shall within 20 days thereafter substitute another Bond and surety, both of which shall comply with the requirements of paragraphs 5.01.B and 5.02.

D. Performance Bond

Any surety bond written for a Jefferson Parish Law Enforcement District One project shall be written by a surety or insurance

company currently on the U.S. Department of Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A rating in the latest printing of the A.M. Best's Key Rating Guide to write individual bonds up to ten percent of policyholder's surplus as shown in the A.M. Best's Key Rating Guide or by a surety company that complies with the requirements of LSA-R.S. 38:2219.

No surety will be accepted from a bondsman which does not have a permanent agent or representative in the State upon whom notices referred to in the General Conditions may be served. Service of said notice on said agent or representative in the State shall be equal to service of notice on the president of the surety, or such other officer as may be concerned. Should the CONTRACTOR's surety, even though approved and accepted by the OWNER, subsequently remove its agency or representative from the State or terminates its residency or license in this State or become insolvent, bankrupt, or otherwise fail, the CONTRACTOR shall immediately furnish a new bond from another company approved by the OWNER, at no additional cost to the OWNER. The new bond shall be executed upon the same terms and conditions as the original bond.

E. Alternative Security

The Owner may in its discretion accept alternative security pursuant to the requirements set forth in the Louisiana public contract law (LSA-R.S. 38:2181 et.seq.).

F. Scope of the Bond and Obligation of the Surety

The CONTRACTOR's surety shall obligate itself to all the terms and covenants of the Contract Documents covering the Work to be performed hereunder. The OWNER reserves the right to order extra work or make changes

by altering, adding to, or deducting from the Work under the conditions and in the manner hereinbefore described without notice to the CONTRACTOR's surety and without in any manner affecting the liability of bondsman or releasing it from any of its obligations hereunder.

The Bond shall also secure for the OWNER the faithful performance of the Contract in strict accordance with the plans and specifications and Contract Documents. It shall protect the OWNER against all lien laws of the State and shall provide for payment of reasonable attorney's fees for enforcement of the Contract and institution of concursus proceedings, if such proceedings become necessary. Likewise, it shall provide that if the ENGINEER is put to labor or expense by enforcement of the Contract and institution of concursus proceedings or through delinquency or insolvency of the CONTRACTOR it shall be equitably paid for such extra expense and services involved.

The surety of the CONTRACTOR shall be and does hereby declare and acknowledge itself by acceptance to be bound to the OWNER as guarantor jointly and in solido with the CONTRACTOR for fulfillment of the foregoing terms including, but not limited to, any provisions for actual or liquidated damages.

5.02 *Licensed Sureties and Insurers*

A. All Bonds and insurance required by the Contract Documents to be purchased and maintained by ~~OWNER or~~ CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided herein or in the Supplementary Conditions.

B. Insurance Coverage is required to be provided by companies authorized to do business in the State of Louisiana. Insurance is to be placed with insurers with an A.M. Best rating of no less than A:VI. This requirement will be waived for workers' compensation coverage only for those contractors whose workers' compensation coverage is placed with companies who participate in the State of Louisiana Workers' Compensation Assigned Risk Pool or the Louisiana Worker's Compensation Corporation.

5.03 *Certificates of Insurance*

A. CONTRACTOR shall, at the same time as CONTRACTOR returns the signed copies of the Agreement to OWNER, deliver to OWNER, with copies to each additional insured identified herein or in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which CONTRACTOR is required to purchase and maintain and each such certificate shall include the Project name, the Project number, proposal number, and OWNER's address as identified in the Agreement. ~~OWNER shall deliver to CONTRACTOR, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by CONTRACTOR or any other additional insured) which OWNER is required to purchase and maintain.~~

5.04 *CONTRACTOR's Liability Insurance*

A. CONTRACTOR shall purchase and maintain such liability and other insurance as is provided herein or in the Supplementary Conditions, as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed by CONTRACTOR, any Subcon-

tractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;

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

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

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance so required by this paragraph 5.04 to be purchased and maintained shall:

1. ~~with respect to insurance required by paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insureds (subject to any customary exclusion in respect of professional liability) OWNER, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions,~~

~~all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;~~

with respect to comprehensive general liability, automobile liability, and umbrella liability, name OWNER as an additional insured, be primary to any insurance carried by the OWNER, and with respect to workers' compensation only, include a Waiver of Subrogation in favor of the OWNER and any principals for whom the OWNER is working, including any co-lessors of such principals; and, with respect to all of the foregoing, be subject to the approval of the OWNER;

2. include at least the specific coverages and be written for not less than the limits of liability provided herein or in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering CONTRACTOR's indemnity obligations under paragraphs 6.07, 6.11, and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days prior written notice has been given by registered or certified mail, return receipt requested, to OWNER and CONTRACTOR and to each other additional insured identified herein or in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the CONTRACTOR

pursuant to paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when CONTRACTOR may be correcting, removing, or replacing defective Work in accordance with paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and CONTRACTOR shall furnish OWNER and each other additional insured identified herein or in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to OWNER and any such additional insured of continuation of such insurance at final payment and one year thereafter); and

8. include a provision which requires that any communication regarding the insurance, including any communication under 5.04 B.5. above, include the Project name, Project number, proposal number, and OWNER's address, as identified in the Agreement.

C. The limits of liability for the insurance required by paragraph 5.4 of the General Conditions shall provide the following coverage for not less than the following amounts or greater where required by Laws and Regulations, and any Jefferson Parish Law Enforcement District One resolutions:

1. Workers' Compensation, etc. under the General Conditions:

The CONTRACTOR shall take out and maintain during the life of this contract, Worker's Compensation Insurance for all his employees in any way engaged in this project. As required by Louisiana State Statute exception: employer's liability shall be \$1,000,000 per occurrence when work

is to be over water and involves maritime exposures, otherwise this limit shall be no less than \$500,000 per occurrence.

2. CONTRACTOR's Comprehensive General Liability Insurance under the General Conditions which shall also include completed operations and product liability coverage:

The CONTRACTOR shall take out and maintain during the life of this contract Comprehensive General Liability Insurance with a combined Single Limit per occurrence for bodily injury and property damage. This insurance shall include coverage for bodily injury and property damage, and indicate on the certificate of insurance the following:

- 1) Premises - operations;
- 2) Broad form contractual liability;
- 3) Products and completed operations;
- 4) Use of contractors and sub-contractors;
- 5) Personal Injury;
- 6) Broad form property damage;
- 7) Explosion, collapse and underground [XCU] coverage.

NOTE: On the certificate of insurance, under the description of operations, the following wording is required: The aggregate loss limit applies to each project or a copy of ISO Form CG 25 03 [ed. 11-85 or latest form] shall be submitted.

COMBINED SINGLE LIMITS [CSL] - AMOUNT OF INSURANCE REQUIRED

CONTRACTS UP TO \$1,000,000:

General contracts - each occurrence/ minimum limits \$500,000.00,

New construction/renovations - each occurrence/minimum limits \$500,000.00*** [depending on building value].

CONTRACTS OVER \$1,000,000:

General contracts - each occurrence/
minimum limits \$1,000,000.00.

New construction/renovations - each
occurrence/minimum limits \$1,000,000.00***
[depending on building value].

*** WHILE THE MINIMUM COMBINED
SINGLE LIMITS OF \$500,000 IS
REQUIRED FOR ALL RENOVATION,
THE VALUE OF THE BUILDING
SHALL BE MULTIPLIED BY 10% AND
THE INSURANCE REQUIREMENTS
WILL BE INCREASED AT \$1,000,000
INTERVALS AND ROUNDED TO THE
NEAREST MILLION.

EXAMPLE: RENOVATIONS ON
A THIRTY-THREE MILLION DOLLAR
BUILDING WOULD REQUIRE THREE
MILLION DOLLARS. [\$3,000,000]
MINIMUM COMBINED SINGLE LIMITS
OF COVERAGE

The CONTRACTOR shall take out and
maintain a policy of Umbrella Liability
Coverage in excess of the primary
insurance afforded above and including
all operations of the CONTRACTOR,
with minimum limits of \$1,000,000.00.

3. The CONTRACTOR shall take out and
maintain during the life of this contract
Business Automobile Liability Insurance with
a Combined Single Limit of \$1,000,000 per
Occurrence for bodily injury and property
damage, unless otherwise indicated. This
insurance shall include for bodily injury and
property damage the following coverage:

- 1) Any automobiles;
- 2) Owned automobiles;
- 3) Hired automobiles;
- 4) Non-owned automobiles.

4. OWNER's Protective Liability.

The CONTRACTOR shall take out
and maintain a policy of OWNER's
Protective Liability for the same limits of
liability for bodily injury and property

damage liability and conditions as
provided hereinabove under
"Comprehensive General Liability
Insurance".

The cost of this coverage is at the
CONTRACTOR's expense.

5. Builder's Risk Insurance

The CONTRACTOR shall take out
and maintain Builder's Risk Insurance at
his expense, to insure both the OWNER
and CONTRACTOR as their interest
may appear. These policies must cover
for such amount of the work as is
determined by the ENGINEER and/or
Architect and shall be the all-risk type of
coverage. Although the insurance
takes account of payments during the
course of the construction from the
OWNER to the CONTRACTOR, it is
understood that the work shall be at the
risk of the CONTRACTOR until finally
accepted by the OWNER as a whole
pursuant to the provisions of the
General Conditions. Except as
otherwise provided by law, the OWNER
is authorized to omit in whole or part the
insurance requirements of this section in
connection with such contracts.

6. Miscellaneous

(a) Deductibles. No insurance
required under this contract shall
include a deductible in excess of
\$10,000.00 unless otherwise approved
by the OWNER and based upon the
company's most recent financial audit,
such increase in the deductible must be
approved in writing prior to the bid
opening date. The cost of all deductible
amounts shall be borne by the
CONTRACTOR.

(b) If at any time any of the said
policies shall be or becomes
unsatisfactory to the OWNER as to form
or substance; or if a company issuing
any such policy shall be or become

unsatisfactory to the OWNER, the CONTRACTOR/Subcontractors shall promptly obtain a new policy, submit the same to the OWNER for approval and submit a certificate thereof as provided above.

Upon failure of a CONTRACTOR/Subcontractor to furnish to deliver and maintain such insurance as above provide this Contract, at the election of the OWNER, may be forthwith declared suspended, discontinued or terminated. Failure of the CONTRACTOR/Subcontractor to take out and/or to maintain insurance shall not relieve the CONTRACTOR/Subcontractor from any liability under the contract, nor shall the insurance requirements be construed to conflict with the obligation of the CONTRACTOR/Subcontractor concerning indemnification.

(c) **WAIVER.** Except as otherwise provided by law, the coverage requirements of this section may be waived in whole or in part on contracts under \$100,000.00 and the OWNER is authorized to use its discretion in regard to insurance requirements for such contracts. Except as otherwise provided by law, the OWNER is authorized to omit in whole or in part the insurance requirements of this section in connection with such contracts.

D. The policies of insurance so required by paragraph 5.04 to be purchased and maintained by CONTRACTOR shall indicate the project number, proposal number, and OWNER's address as identified in the Agreement and shall also include the following clauses:

1. The CONTRACTOR/Sub-contractor insurers will have no right of recovery or subrogation against the OWNER, it being the intention of the parties that the insurance policy so affected shall protect both parties and

be the primary coverage for any and all losses covered by the below described insurance.

2. The OWNER shall be named as additional insured as regards to negligence by the CONTRACTOR [ISO Forms CG 20 10 (Form B) or latest applicable ISO form], or equivalent.

3. The insurance companies issuing the policy or policies shall have no recourse against the OWNER for payment of any premiums or for assessments under any form of policy.

4. Any and all deductibles in the insurance policies shall be assumed by and be for the amount of \$10,000.00 unless increased as set forth in section 5.04 C6(a) and at the sole risk of the CONTRACTOR/Sub-contractor.

5. Any and all communications regarding the insurance shall include the Project name, Project number, proposal number, and OWNER's address, as identified in the Agreement.

5.05 OWNER's Liability Insurance

A. In addition to the insurance required to be provided by CONTRACTOR under paragraph 5.04, OWNER, at OWNER's option, may purchase and maintain at OWNER's expense OWNER's own liability insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

5.06 Property Insurance

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

~~1. include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an additional insured;~~

~~2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;~~

~~3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);~~

~~4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by OWNER prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by ENGINEER;~~

~~5. allow for partial utilization of the Work by OWNER;~~

~~6. include testing and startup; and~~

~~7. be maintained in effect until final payment is made unless otherwise agreed to in writing by OWNER, CONTRACTOR, and ENGINEER with 30 days written notice~~

~~to each other additional insured to whom a certificate of insurance has been issued.~~

~~B. OWNER shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.~~

~~C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with paragraph 5.07.~~

~~D. OWNER shall not be responsible for purchasing and maintaining any property insurance specified in this paragraph 5.06 to protect the interests of CONTRACTOR, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified herein or in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by CONTRACTOR, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.~~

~~E. If CONTRACTOR requests in writing that other special insurance be included in the property insurance policies provided under paragraph 5.06, OWNER shall, if possible, include such insurance, and the cost thereof~~

~~will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the Site, OWNER shall in writing advise CONTRACTOR whether or not such other insurance has been procured by OWNER.~~

5.07 Waiver of Rights

~~A. OWNER and CONTRACTOR intend that all policies purchased in accordance with paragraph 5.06 will protect OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. OWNER and CONTRACTOR waive all rights against each other and their respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of~~

~~insurance held by OWNER as trustee or otherwise payable under any policy so issued.~~

~~B. OWNER waives all rights against CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for:~~

~~1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to OWNER's property or the Work caused by, arising out of, or resulting from fire or other peril whether or not insured by OWNER; and~~

~~2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by OWNER during partial utilization pursuant to paragraph 14.05, after Substantial Completion pursuant to paragraph 14.04, or after final payment pursuant to paragraph 14.07.~~

~~C. Any insurance policy maintained by OWNER covering any loss, damage or consequential loss referred to in paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against CONTRACTOR, Subcontractors, ENGINEER, or ENGINEER's Consultants and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them.~~

5.08 Receipt and Application of Insurance Proceeds

~~A. Any insured loss under the policies of insurance required by paragraph 5.06 will be adjusted with OWNER and made payable to OWNER as fiduciary for the insureds, as their interests may appear, subject to the~~

requirements of any applicable mortgage clause and of paragraph 5.08.B. OWNER shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.

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

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If ~~either~~ OWNER or CONTRACTOR has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by ~~the other party in~~ CONTRACTOR in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the ~~objecting party~~ OWNER shall so notify the ~~other party~~ CONTRACTOR in writing within ~~40~~ thirty days after receipt of the certificates (or other evidence requested) required by paragraph 2.05.C. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If ~~either party~~ CONTRACTOR does not purchase or maintain all of the Bonds and insurance required ~~of such party~~ by the Con-

tract Documents, ~~such party~~ the OWNER shall notify the ~~other party~~ CONTRACTOR in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, including, without limitation, termination for default in light of the material importance of the Bonds and insurance to OWNER, the ~~other party~~ OWNER may elect to obtain equivalent Bonds or insurance to protect ~~such other party's~~ the OWNER's interests at the expense of the ~~party~~ CONTRACTOR who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. CONTRACTOR shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the

means, methods, techniques, sequences, and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of OWNER or ENGINEER in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

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

For purposes of giving or receiving notice, directives, Change Orders, or any other information from ENGINEER or OWNER to CONTRACTOR, the CONTRACTOR shall designate one person as Project Manager to receive such notice directives, Change Orders, or other information. If the person so identified by CONTRACTOR is not present on the job Site during normal working hours for any consecutive 48 hour period, the CONTRACTOR shall in writing, addressed to ENGINEER and OWNER identify the individual who is acting as Project Manager. CONTRACTOR may designate the resident superintendent as the Project Manager.

6.02 Labor; Working Hours

A. CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out, and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday, or any legal holiday without OWNER's written consent (which will not be unreasonably withheld) given after prior written notice to ENGINEER. For purposes of the foregoing sentence and this Contract "regular working hours" shall mean between 7:00 a.m. and 6:00 p.m. Emergency work may be performed without prior permission. CONTRACTOR shall establish a normal work schedule which does not exceed 40 hours per week. Overtime shall be scheduled only after CONTRACTOR obtains written permission from OWNER.

6.03 Services, Materials, and Equipment

A. Unless otherwise specified in the General Requirements, CONTRACTOR shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work. All construction equipment and machinery used by CONTRACTOR to perform its obligations under the CONTRACT shall be operational and maintained in good repair during the Contract as necessary for the CONTRACTOR's timely performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of OWNER. If required by ENGI-

NEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents. The CONTRACTOR agrees to assign to the OWNER at the time of final completion of the Work any and all manufacturer's warranties relating to equipment, machinery, materials and labor used and incorporated in the Work and CONTRACTOR further agrees to perform the Work in such a manner to preserve any and all manufacturer's warranties.

6.04 *Progress Schedule*

A. CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.07 as it may be adjusted from time to time as provided below.

1. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.07) proposed adjustments in the progress schedule that will not result in changing the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of Article 12 and any applicable provisions in the Specifications. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.

6.05 *Substitutes and "Or-Equals"*

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

1. *"Or-Equal" Items:* If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the proposed item may, in ENGINEER's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

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

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

2. *Substitute Items*

a. If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item under paragraph 6.05.A.1, it will be considered a proposed substitute item.

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

c. The procedure for review by ENGINEER will be as set forth in paragraph 6.05.A.2.d, as supplemented in the General Requirements and as ENGINEER may decide is appropriate under the circumstances.

d. CONTRACTOR shall first make written application to ENGINEER for review of a proposed substitute item of material or equipment that CONTRACTOR seeks to furnish or use. The application shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to

the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change, all of which will be considered by ENGINEER in evaluating the proposed substitute item. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute item.

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by ENGINEER. CONTRACTOR shall submit sufficient information to allow ENGINEER, in ENGINEER's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in subparagraph 6.05.A.2.

C. Engineer's Evaluation: ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 6.05.A and 6.05.B. ENGINEER will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized until ENGINEER's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal."

ENGINEER will advise CONTRACTOR in writing of any negative determination.

D. *Special Guarantee:* OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute.

E. *ENGINEER's Cost Reimbursement:* ENGINEER will record time required by ENGINEER and ENGINEER's Consultants in evaluating substitute proposed or submitted by CONTRACTOR pursuant to paragraphs 6.05.A.2 and 6.05.B and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER approves a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute.

F. *CONTRACTOR's Expense:* CONTRACTOR shall provide all data in support of any proposed substitute or "or-equal" at CONTRACTOR's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. CONTRACTOR shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to OWNER as indicated in paragraph 6.06.B), whether initially or as a replacement, against whom OWNER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection. Notwithstanding the foregoing, CONTRACTOR shall not award any work to any Subcontractor without prior written approval of the OWNER, which approval will not be given until CONTRACTOR submits the information required regarding Subcontractors

in the Bid Instructions or Supplementary Conditions. statement shall contain such information as the Owner may require. Such consent shall not be withheld unless a legal ground exists, such as, but not limited to, a subcontractor who has been disqualified from Jefferson Parish Law Enforcement District One projects.

If such consent is given, the CONTRACTOR will be permitted to sublet a portion of the work, but shall perform with his own organization work amounting to at least 50 percent of the total contract cost. Any items designated in the Contract as "specialty items" may be performed by subcontract and the costs of such may be deducted from the total cost before computing the amount of work required to be performed by the CONTRACTOR with his own organization.

Except as otherwise provided by law, the OWNER is authorized to omit in whole or in part the provision requiring at least 50 percent of the Work or services to be performed by the Contractor. The determination to waive the requirement in whole or in part that at least 50 percent of the Work or services to be performed by the Contractor must be set forth in the bid specifications or addenda.

An approved Subcontractor shall not subcontract any portion of the authorized work. However, except as provided by law, this provision may be waived in writing in whole or in part by the OWNER.

If the CONTRACTOR shall sublet any part of this Contract, the CONTRACTOR shall be as fully responsible to the OWNER for the acts and omissions of his Subcontractor and of any persons either directly or indirectly employed by his Subcontractor as he is for the acts and omissions of persons directly employed by himself.

B. If the Supplementary Conditions or the Bid Instructions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to OWNER in advance for acceptance by OWNER by a

specified date prior to the Effective Date of the Agreement, and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, or the Bid Instructions, OWNER's written acceptance ~~(either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents)~~ of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. ~~be revoked on the basis of reasonable objection after due investigation.~~ Revocation must be based on a legal ground, such as, but not limited to a subcontractor who has been disqualified from Jefferson Parish Law Enforcement District One projects. Contractor shall submit an acceptable replacement for the rejected CONTRACTOR shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by OWNER of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of OWNER or ENGINEER to reject defective Work.

C. CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other individual or entity, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other

individual or entity except as may otherwise be required by Laws and Regulations.

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

E. CONTRACTOR shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with ENGINEER through CONTRACTOR.

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

G. All Work performed for CONTRACTOR by a Subcontractor or Supplier will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER. ~~Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in paragraph 5.06, the agreement between the CONTRACTOR and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against OWNER, CONTRACTOR, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance~~

~~applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.~~

6.07 *Patent Fees and Royalties*

A. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the

prosecution of the Work which are applicable at the time of opening of Bids, ~~or, if there are no Bids, on the Effective Date of the Agreement.~~ CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto, such as plant investment fees.

6.09 *Laws and Regulations*

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

B. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations under paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids ~~(or, on the Effective Date of the Agreement if there were no Bids)~~ having an effect on the cost or time of performance of the Work may be the subject of an adjustment in Contract Price or Contract Times. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in paragraph 10.05.

D. Pursuant to LSA-R.S. 38:2196, with respect to public contracts involving the state or a political subdivision of the state, when the Work is to be done in this state (Louisiana), or the services are to be provided or the materials are to be supplied in this state, provisions in such agreements requiring disputes arising thereunder to be resolved in a forum outside of this state or requiring their interpretation to be governed by the laws of another jurisdiction are inequitable and against the public policy of this state.

6.10 Taxes

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

6.11 Use of Site and Other Areas

A. Limitation on Use of Site and Other Areas

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

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

3. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultant, and the officers, directors, partners, employees, agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, ENGINEER, or any other party indemnified hereunder. ~~to the extent caused by or based upon CONTRACTOR's performance of the Work.~~

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

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

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

6.12 Record Documents

A. CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to ENGINEER for OWNER.

6.13 *Safety and Protection*

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

1. all persons on the Site or who may be affected by the Work;
2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. CONTRACTOR shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may

affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury, or loss to any property referred to in paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or ENGINEER's Consultant, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. CONTRACTOR shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

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

6.16 Emergencies

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, CONTRACTOR is obligated to act to prevent threatened damage, injury, or loss. ~~CONTRACTOR shall give ENGINEER prompt written notice~~ notice immediately but in no event more than 24 hours after the alleged emergency if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If ENGINEER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Work Change Directive or Change Order will be issued and, in the absence of agreement, a Claim may be made pursuant to paragraph 10.05.

6.17 Shop Drawings and Samples

A. CONTRACTOR shall submit Shop Drawings to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. All submittals will be identified as ENGINEER may require and in the number of copies specified in the General Requirements. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show ENGINEER the services, materials, and equipment CONTRACTOR proposes to provide and to enable ENGINEER to review the information for the limited purposes required by paragraph 6.17.E.

B. CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers, and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review

the submittal for the limited purposes required by paragraph 6.17.E. The numbers of each Sample to be submitted will be as specified in the Specifications.

C. Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER as required by paragraph 2.07, any related Work performed prior to ENGINEER's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.

D. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:

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

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

c. all information relative to means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto; and

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

2. Each submittal shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents

with respect to CONTRACTOR's review and approval of that submittal.

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

E. *ENGINEER's Review*

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

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

3. ENGINEER's review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called

ENGINEER's attention to each such variation at the time of each submittal as required by paragraph 6.17.D.3 and ENGINEER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for complying with the requirements of paragraph 6.17.D.1.

F. *Resubmittal Procedures*

1. CONTRACTOR shall make corrections required by ENGINEER and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals.

6.18 *Continuing the Work*

A. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.04 or as OWNER and CONTRACTOR may otherwise agree in writing.

6.19 *CONTRACTOR's General Warranty and Guarantee*

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

1. abuse, modification, or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, Suppliers, or any other individual or entity

for whom CONTRACTOR is responsible;
or

2. normal wear and tear under normal usage.

B. CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents:

1. observations by ENGINEER;
2. recommendation by ENGINEER or payment by OWNER of any progress or final payment;
3. the issuance of a certificate of Substantial Completion by ENGINEER or any payment related thereto by OWNER;
4. use or occupancy of the Work or any part thereof by OWNER;
5. any acceptance by OWNER or any failure to do so;
6. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by ENGINEER;
7. any inspection, test, or approval by others; or
8. any correction of defective Work by OWNER.

6.20 Indemnification

~~A. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and~~

~~subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage:~~

~~1. is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom; and~~

~~2. is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such individual or entity.~~

To the fullest extent permitted by law, CONTRACTOR agrees to protect, defend, indemnify and save the OWNER, ENGINEER, ENGINEER Consultants, its agents, officials, employees, servants, including volunteers, or any firm, company, organization, or individual, or their contractors, or subcontractors with whom the OWNER may be contracted, harmless from and against any and all claims, demands, loss or destruction of property, actions, and causes of action of every kind and character including but not limited to claims based on negligence, strict liability, and absolute liability which may arise in favor of any person or persons on account of illness, disease, loss of property, services, wages, death or personal injuries resulting from operations contemplated by this Contract, regardless of whether others may be wholly, concurrently, partially or solely negligent, or strictly liable, or absolutely liable

or otherwise at fault, and regardless of any defect in the premises, equipment, or materials, irrespective of whether same preexisted this Agreement, except damages arising out of injuries to or property claims of third parties caused by the sole negligence of OWNER, its employees or agents. Further, CONTRACTOR hereby agrees to indemnify the OWNER for all reasonable expenses including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs incurred by or imposed upon the OWNER in connection therewith for any such loss, damage, injury or other casualty. CONTRACTOR further agrees to pay all reasonable expenses and attorneys' fees incurred by the OWNER in establishing the right to indemnity pursuant to the provisions in this section.

B. In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of CONTRACTOR under paragraph 6.20.A shall not extend to the liability of ENGINEER and ENGINEER's Consultants or to the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys,

Change Orders, designs, or Specifications; or

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

ARTICLE 7 - OTHER WORK

7.01 *Related Work at Site*

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

1. written notice thereof will be given to CONTRACTOR prior to starting any such other work; and

2. if OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in paragraph 10.05.

B. CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (and OWNER, if OWNER is performing the other work with OWNER's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of

ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

C. If the proper execution or results of any part of CONTRACTOR's Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to ENGINEER in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure to so report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work except for latent defects and deficiencies in such other work.

7.02 Coordination

A. If OWNER intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
2. the specific matters to be covered by such authority and responsibility will be itemized; and
3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, OWNER shall have sole authority and responsibility for such coordination.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 Communications to Contractor

A. Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.02 Replacement of ENGINEER

A. In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer to whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER.

8.03 Furnish Data

A. OWNER shall promptly furnish the data required of OWNER under the Contract Documents.

8.04 Pay Promptly When Due

A. OWNER shall make payments to CONTRACTOR promptly when they are due as provided in paragraphs 14.02.C and 14.07.C.

8.05 Lands and Easements; Reports and Tests

A. OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.01 and 4.05. Paragraph 4.02 refers to OWNER's identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by ENGINEER in preparing the Contract Documents.

8.06 Insurance

~~A. OWNER's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.~~

8.07 Change Orders

A. OWNER is obligated to execute Change Orders as indicated in paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. OWNER's responsibility in respect to certain inspections, tests, and approvals is set forth in paragraph 13.03.B.

8.09 *Limitations on OWNER's Responsibilities*

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

8.10 *Undisclosed Hazardous Environmental Condition*

A. OWNER's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

~~A. If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract Documents, OWNER's responsibility in respect thereof will be as set forth in the Supplementary Conditions.~~

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *OWNER'S Representative*

A. ENGINEER will be OWNER's representative during the construction period.

The duties and responsibilities and the limitations of authority of ENGINEER as OWNER's representative during construction are set forth in the Contract Documents and will not be changed without written consent of OWNER and ENGINEER.

B. The ENGINEER shall identify a specific individual to serve as liaison between the OWNER and CONTRACTOR and between the ENGINEER and CONTRACTOR. The ENGINEER will notify the OWNER and CONTRACTOR of the name of an acting replacement as ENGINEER representative whenever the person so designated is not available. Whenever the CONTRACTOR or OWNER requires information, direction, or assistance, the CONTRACTOR or OWNER shall notify the individual designated by the ENGINEER.

9.02 *Visits to Site*

A. ENGINEER will make visits to the Site at intervals appropriate to the various stages of construction as ENGINEER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, ENGINEER, for the benefit of OWNER, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. ENGINEER's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defective Work.

B. ENGINEER's visits and observations are subject to all the limitations on ENGINEER's authority and responsibility set

forth in paragraph 9.10, and particularly, but without limitation, during or as a result of ENGINEER's visits or observations of CONTRACTOR's Work ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in providing more extensive observation of the Work. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.10 and in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the Site who is not ENGINEER's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Clarifications and Interpretations*

A. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as ENGINEER may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a written clarification or interpretation, a Claim may be made therefor as provided in paragraph 10.05.

9.05 *Authorized Variations in Work*

A. ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER and also on CONTRACTOR, who shall perform the Work involved promptly. ~~If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of a Field Order, a Claim may be made therefor as provided in paragraph 10.05.~~ ENGINEER will promptly obtain the signature of the CONTRACTOR on all Field Orders. This signature confirms the CONTRACTOR's acknowledgment that the CONTRACTOR is not entitled to any change in the Contract Price or the Contract Times. The ENGINEER will obtain the signature of the CONTRACTOR on all Field Orders on a weekly basis.

9.06 *Rejecting Defective Work*

A. ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective, or that ENGINEER believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER will also have authority to require special inspection or testing of the Work as provided in paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.07 *Shop Drawings, Change Orders and Payments*

A. In connection with ENGINEER's authority as to Shop Drawings and Samples, see paragraph 6.17.

B. In connection with ENGINEER's authority as to Change Orders, see Articles 10, 11, and 12.

C. In connection with ENGINEER's authority as to Applications for Payment, see Article 14.

9.08 Determinations for Unit Price Work

A. ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR the ENGINEER's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). ENGINEER's written decision thereon will be final and binding (except as modified by ENGINEER to reflect changed factual conditions or more accurate data) upon OWNER and CONTRACTOR, subject to the provisions of paragraph 10.05.

9.09 Decisions on Requirements of Contract Documents and Acceptability of Work

A. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work, the quantities and classifications of Unit Price Work, the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to ENGINEER in writing, in accordance with the provisions of paragraph 10.05, with a request for a formal decision.

B. When functioning as interpreter and judge under this paragraph 9.09, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in

connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by ENGINEER pursuant to this paragraph 9.09 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.07) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.10 Limitations on ENGINEER's Authority and Responsibilities

A. Neither ENGINEER's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by ENGINEER shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

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

C. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. ENGINEER's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this paragraph 9.10 shall also apply to ENGINEER's Consultants, Resident Project Representative, and assistants.

F. The duties, responsibilities, and limitations of authority of the Resident Project Representative are as further defined in the Supplementary Conditions and Exhibit A, which is attached thereto and incorporated therein by reference.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided). A change in the Contract Price or the Contract Times shall be accomplished only by a Written Amendment or a Change Order. Accordingly, no course of conduct or dealings between the parties, no express or implied acceptance of alterations or additions to the Work, and no claim that the OWNER has been unjustly

enriched by any alterations or additions to the Work shall be the basis of any claim for an increase in any amount due under the Contract Documents or a change in any time period provided for in the Contract Documents.

B. If OWNER and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in paragraph 3.04, except in the case of an emergency as provided in paragraph 6.16 or in the case of uncovering Work as provided in paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. OWNER and CONTRACTOR shall execute appropriate Change Orders recommended by ENGINEER (or Written Amendments) covering:

1. changes in the Work which are: (i) ordered by OWNER pursuant to paragraph 10.01.A, (ii) required because of acceptance of defective Work under paragraph 13.08.A or OWNER's correction of defective Work under paragraph 13.09, or (iii) agreed to by the parties;

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

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.18.A. Agreements on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments to the Contract Price and the Contract Times. In the event a Change Order increases the Contract Price, the CONTRACTOR shall include the Work covered by such Change Order in applications for payments as if such Work were originally part of the Contract Documents.

10.04 *Notification to Surety*

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

10.05 *Claims and Disputes*

A. *Notice:* Written notice stating the general nature of each Claim, dispute, or other matter shall be delivered by the claimant to ENGINEER and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. Notice of the amount or

extent of the Claim, dispute, or other matter with supporting data shall be delivered to the ENGINEER and the other party to the Contract within 60 days after the start of such event (unless ENGINEER allows additional time for claimant to submit additional or more accurate data in support of such Claim, dispute, or other matter). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to ENGINEER and the claimant within 30 days after receipt of the claimant's last submittal (unless ENGINEER allows additional time).

B. *ENGINEER's Decision:* ENGINEER will render a formal decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any. ENGINEER's written decision on such Claim, dispute, or other matter will be final and binding upon OWNER and CONTRACTOR unless:

1. an appeal from ENGINEER's decision is taken within the time limits and in accordance with the dispute resolution procedures set forth in Article 16; or

2. if no such dispute resolution procedures have been set forth in Article 16, a written notice of intention to appeal from ENGINEER's written decision is delivered by OWNER or CONTRACTOR to the other and to ENGINEER within 30 days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction within 60 days after the date of such decision or within 60 days after Substantial Completion, whichever is later (unless otherwise agreed in writing by OWNER and CONTRACTOR), to

exercise such rights or remedies as the appealing party may have with respect to such Claim, dispute, or other matter in accordance with applicable Laws and Regulations.

C. If ENGINEER does not render a formal decision in writing within the time stated in paragraph 10.05.B, a decision denying the Claim in its entirety shall be deemed to have been issued 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

D. No Claim for an adjustment in Contract Price or Contract Times (or Milestones) will be valid if not submitted in accordance with this paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to CONTRACTOR will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Such employees shall include without limitation superintendents, foremen, and other

personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by OWNER in writing.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

3. Payments made by CONTRACTOR to Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER, who will then determine, with the advice of ENGINEER, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work

and fee as provided in this paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work, but only to the extent authorized and approved in writing by ENGINEER.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of CONTRACTOR.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of ENGINEER, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work,

and for which CONTRACTOR is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance of the Work ~~(except losses and damages within the deductible amounts of property insurance established in accordance with paragraph 5.06.D)~~, provided such losses and damages have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressage, and similar petty cash items in connection with the Work.

i. When the Cost of the Work is used to determine the value of a Change Order or of a Claim, the cost of premiums for additional Bonds and insurance required because of the

changes in the Work or caused by the event giving rise to the Claim.

~~j. When all the Work is performed on the basis of cost plus, the costs of premiums for all Bonds and insurance CONTRACTOR is required by the Contract Documents to purchase and maintain.~~

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnerships and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by CONTRACTOR, whether at the Site or in CONTRACTOR's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.01.A.1 or specifically covered by paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site.

3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.

4. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly

supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraphs 11.01.A and 11.01.B.

C. *CONTRACTOR's Fee:* ~~When all the Work is performed on the basis of cost plus, CONTRACTOR's fee shall be determined as set forth in the Agreement.~~ When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, CONTRACTOR's fee shall be determined as set forth in paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to paragraphs 11.01.A and 11.01.B, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

11.02 Cash Allowances

A. It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums as may be acceptable to OWNER and ENGINEER. CONTRACTOR agrees that:

1. the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. CONTRACTOR's costs for unloading and handling on the Site, labor, installation costs, overhead, profit, and other expenses contemplated for the allowances have been included in the

Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

B. Prior to final payment, an appropriate Change Order will be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER subject to the provisions of paragraph 9.08.

B. Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.

~~C. OWNER or CONTRACTOR may make a Claim for an adjustment in the Contract Price in accordance with paragraph 10.05 if:~~

~~1. the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and~~

~~2. there is no corresponding adjustment with respect any other item of Work; and~~

~~3. if CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense or OWNER believes that OWNER is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.~~

The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:

(1) if the total cost of a particular item of Unit Price Work amounts to ten (10) percent or more of the Contract Price and the variation in the quantity twenty-five (25) percent from the estimated quantity of such item indicated in the Agreement; and

(2) if there is no corresponding adjustment with respect to any other item of Work; and

(3) if CONTRACTOR believes that CONTRACTOR has incurred additional expense as a result thereof; or if OWNER believes that the quantity variation entitles OWNER to an adjustment in the unit price, either OWNER or CONTRACTOR may make a claim for an adjustment in the Contract Price in accordance with paragraph 10.05 if the parties are unable to agree as to the effect of any such variations in the quantity of Unit Price Work performed.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 Change of Contract Price

A. The Contract Price may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the

Claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 12.01.C.2) documented and itemized as required by La. R.S. 38:2212; or

~~3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in paragraph 11.01) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 12.01.C).~~

C. *CONTRACTOR's Fee:* The CONTRACTOR's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

~~2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:~~

~~a. for costs incurred under paragraphs 11.01.A.1 and 11.01.A.2, the CONTRACTOR's fee shall be 15 percent;~~

~~b. for costs incurred under paragraph 11.01.A.3, the CONTRACTOR's fee shall be five percent;~~

~~c. where one or more tiers of sub-contracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;~~

~~d. no fee shall be payable on the basis of costs itemized under paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;~~

~~e. the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee by an amount equal to five percent of such net decrease; and~~

~~f. when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.~~

12.02 *Change of Contract Times*

A. The Contract Times (or Milestones) may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Times (or Milestones) shall be based on written notice submitted by the party making the claim to the ENGINEER and the other party to the

Contract in accordance with the provisions of paragraph 10.05.

B. Any adjustment of the Contract Times (or Milestones) covered by a Change Order or of any Claim for an adjustment in the Contract Times (or Milestones) shall be properly supported in accordance with the applicable provisions of the Contract Documents and will be determined in accordance with the provisions of this Article 12. No claims for an adjustment in the Contract Times (or Milestones) will be valid unless properly supported in accordance with the applicable provisions of the Contract Documents, submitted, and determined in accordance with the provisions of this Article 12.

C. All time limits stated in the Contract Documents are of the essence of the Agreement. The CONTRACTOR acknowledges and understands that failure by the CONTRACTOR will cause significant damage to the OWNER both in direct damages as well as delay damages, including but not limited to the damages specified in the Agreement as actual damages and as liquidated damages.

12.03 *Delays Beyond CONTRACTOR's Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in paragraph 12.02.A. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

12.04 *Delays Within CONTRACTOR's Control*

A. The Contract Times (or Milestones) will not be extended due to delays within the control of CONTRACTOR. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

12.05 *Delays Beyond OWNER's and CONTRACTOR's Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay.

12.06 *Delay Damages*

~~A. In no event shall OWNER or ENGINEER be liable to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:~~

~~1. delays caused by or within the control of CONTRACTOR; or~~

~~2. delays beyond the control of both OWNER and CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.~~

A. Apart from extension of time for unavoidable delays and the waiving of any applicable liquidated damages, in no event shall OWNER or ENGINEER be liable to the CONTRACTOR, any Subcontractor, and Supplier, or any other person or organization, or any surety for or any employee or agent of any of them, and no payment or allowance of any kind shall be made to the CONTRACTOR as compensation for damages because of

hindrance or delay for any cause in the progress of Work, whether such delay be avoidable or unavoidable. Time limitations required by OWNER shall be for the benefit of OWNER and contractors under other contracts who have entered into such contracts with OWNER in reliance on the time limitations set forth in these Contract Documents. Any claim by CONTRACTOR for damages due to delay by another contractor shall be asserted against that contractor. CONTRACTOR shall accept the risk of any delays caused by the rate of progress of the Work to be performed under the Contract or other contract.

~~B. Nothing in this paragraph 12.06 bars a change in Contract Price pursuant to this Article 12 to compensate CONTRACTOR due to delay, interference, or disruption directly attributable to actions or inactions of OWNER or anyone for whom OWNER is responsible.~~

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which OWNER or ENGINEER has actual knowledge will be given to CONTRACTOR. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

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

13.03 *Tests and Inspections*

A. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.04.B shall be paid as provided in said paragraph 13.04.B; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish ENGINEER the required certificates of inspection or approval.

D. CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for OWNER's and ENGINEER's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by

organizations acceptable to OWNER and ENGINEER.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by CONTRACTOR without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation.

F. Uncovering Work as provided in paragraph 13.03.E shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR's intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER's observation and replaced at CONTRACTOR's expense.

B. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to - such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, OWNER may

make a Claim therefor as provided in paragraph 10.05. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction, unless CONTRACTOR fails to provide written notice as required by paragraph 13.03.F. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

13.05 *OWNER May Stop the Work*

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

13.06 *Correction or Removal of Defective Work*

A. CONTRACTOR shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by ENGINEER, remove it from the Project and replace it with Work that is not defective. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for CONTRACTOR's use by OWNER or permitted by Laws and Regulations as contemplated in paragraph 6.11.A is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions: (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by OWNER, remove it from the Project and replace it with Work that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or repaired or may have the rejected Work removed and replaced, and all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

B. In special circumstances where a particular item of equipment is placed in continuous service for the benefit of OWNER before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

C. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

D. CONTRACTOR's obligations under this paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, OWNER (and, prior to ENGINEER's recommendation of final payment, ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to OWNER's evaluation of and determination to accept such defective Work (such costs to be approved by ENGINEER as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by CONTRACTOR pursuant to this sentence. If any such acceptance occurs prior to ENGINEER's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and OWNER shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

13.09 OWNER May Correct Defective Work

A. If CONTRACTOR fails within a reasonable time after written notice from ENGINEER to correct defective Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.06.A, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days written notice to CONTRACTOR, correct and remedy any such deficiency.

B. In exercising the rights and remedies under this paragraph, OWNER shall proceed expeditiously. In connection with such corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the Site, take possession of all or part of the Work and suspend CONTRACTOR's services related thereto, take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER's representatives, agents and employees, OWNER's other contractors, and ENGINEER and ENGINEER's Consultants access to the Site to enable OWNER to exercise the rights and remedies under this paragraph.

C. All Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by OWNER in exercising the rights and remedies under this paragraph 13.09 will be charged against CONTRACTOR, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, OWNER may

make a Claim therefor as provided in paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work or others destroyed or damaged by correction, removal, or replacement of CONTRACTOR's defective Work.

D. CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies under this paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 Schedule of Values

A. The schedule of values established as provided in paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to ENGINEER. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 Progress Payments

A. Applications for Payments

1. At least 20 days before the date established for each progress payment (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale,

invoice, or other documentation warranting that OWNER has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect OWNER's interest therein, all of which must be satisfactory to OWNER.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of CONTRACTOR stating that all previous progress payments received on account of the Work have been applied on account to discharge CONTRACTOR's legitimate obligations associated with prior Applications for Payment, the latest updated progress schedule, along with all update reports required by the Contract Documents for such updated progress schedule, and any daily reports for the month covered by the respective Application that are required by the Contract Documents.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

4. CONTRACTOR shall also comply with the following specific requirements:

a. The aggregate cost of materials stored offsite shall not at any time, without written approval of the OWNER, exceed the amount identified in the Supplementary Conditions.

b. Title to such materials shall be vested in the OWNER, as evidenced by documentation satisfactory in form and substance to the OWNER, including, without limitation, recorded financing statements, UCC filings, and UCC searches.

c. With each application for payment, the CONTRACTOR shall submit to the OWNER a written list identifying each location where materials are stored off the Project Site and the value of materials at each location. The CONTRACTOR shall procure insurance satisfactory to the OWNER for materials stored off the Project Site in an amount not less than the total value thereof.

d. The consent of any Surety shall be obtained to the extent required prior to payment for any materials stored off the Project Site.

e. Representatives of the OWNER shall have the right to make inspections of the storage areas at any time.

f. Such materials shall be (1) protected from diversion, destruction, theft and damage to the satisfaction of the OWNER; (2) specifically marked for use on the Project; and (3) segregated from other materials at the storage facility.

B. *Review of Applications*

1. ENGINEER will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER or return the Application to CONTRACTOR indicating in writing ENGINEER's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application.

2. ENGINEER's recommendation of any payment requested in an Application

for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER's observations on the Site of the executed Work as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules, that to the best of ENGINEER's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.08, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to CONTRACTOR's being entitled to such payment, including the submission of all of the supporting documentation as is required by the Contract Documents to accompany the Application, appear to have been fulfilled in so far as it is ENGINEER's responsibility to observe the Work.

3. By recommending any such payment ENGINEER will not thereby be deemed to have represented that: (i) inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents; or (ii) that there may not be other matters or issues between the parties that might entitle CONTRAC-

TOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.

4. Neither ENGINEER's review of CONTRACTOR's Work for the purposes of recommending payments nor ENGINEER's recommendation of any payment, including final payment, will impose responsibility on ENGINEER to supervise, direct, or control the Work or for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for CONTRACTOR's failure to comply with Laws and Regulations applicable to CONTRACTOR's performance of the Work. Additionally, said review or recommendation will not impose responsibility on ENGINEER to make any examination to ascertain how or for what purposes CONTRACTOR has used the moneys paid on account of the Contract Price, or to determine that title to any of the Work, materials, or equipment has passed to OWNER free and clear of any Liens.

5. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make the representations to OWNER referred to in paragraph 14.02.B.2. ENGINEER may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Written Amendment or Change Orders;

c. OWNER has been required to correct defective Work or complete Work in accordance with paragraph 13.09; or

d. ENGINEER has actual knowledge of the occurrence of any of the events enumerated in paragraph 15.02.A.

e. ENGINEER has knowledge that CONTRACTOR has failed to pay Subcontractors or Suppliers or for labor;

f. CONTRACTOR has failed to make submittals in accordance with the accepted schedules or otherwise failed to comply with paragraph 2.07 or failed to submit such supporting documentation as is required by the Contract Documents to accompany the Application, including but not limited to the documentation identified in paragraph 14.02. A;

g. CONTRACTOR owes or may owe OWNER liquidated damages, actual damages, or both, in accordance with the provisions in the Agreement regarding delay in completion of the Work within the Contract Times.

C. *Payment Becomes Due*

1. ~~Ten~~ Thirty days after presentation of the Application for Payment to OWNER with ENGINEER's recommendation, the amount recommended will (subject to the provisions of paragraph 14.02.D) become due, and when due will be paid by OWNER to CONTRACTOR.

D. *Reduction in Payment*

1. OWNER may refuse to make payment of the full amount recommended by ENGINEER because:

a. claims have been made against OWNER on account of CONTRACTOR's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where CONTRACTOR has delivered a specific Bond satisfactory to OWNER to secure the satisfaction and discharge of such Liens;

c. there are other items entitling OWNER to a set-off against the amount recommended; or

d. OWNER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.02.B.5.a through 14.02.B.5.c and 14.02.B.5.e. through 14.02.B.5.g. or paragraph 15.02.A.

e. Punch lists generated during a construction project shall include the cost estimates for the particular items of work the design professional has developed based on the mobilization, labor, materials and equipment costs of correcting each punch list item. The Owner shall withhold from payment the value of the punch list as per LSA-R.S. 38:2248 B.

2. If OWNER refuses to make payment of the full amount recommended by ENGINEER, OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action and promptly pay CONTRACTOR any amount remaining after deduction of the amount so withheld. OWNER shall promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and CONTRACTOR, when

CONTRACTOR corrects to OWNER's satisfaction the reasons for such action.

3. If it is subsequently determined that OWNER's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by paragraph 14.02.C.1.

14.03 *CONTRACTOR's Warranty of Title*

A. CONTRACTOR warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Promptly thereafter, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment, along with cost estimates as required by law. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete,

ENGINEER will within 14 days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER's objections, ENGINEER considers the Work substantially complete, ENGINEER will within said 14 days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items, including cost estimates, to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing prior to ENGINEER's issuing the definitive certificate of Substantial Completion, ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

B. OWNER shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

C. Upon issuance of the definitive certificate of Substantial Completion, OWNER, through its governing authority, shall adopt a resolution accepting the work as substantially complete, which CONTRACTOR shall file with the Clerk of Court and Ex-Officio Recorder of Mortgages. CONTRACTOR may also apply at the appropriate time for payment of retainage following the procedure for

progress payments. In accordance with the Public Contract Law, OWNER shall withhold from any payment made, an amount equal to the value established by the ENGINEER of the cost of the incomplete items contained on the punch list of items to be completed or corrected that was prepared by the ENGINEER in accordance with paragraph 14.07.A, and an amount to cover the cost of any known claims of materialmen, laborers, suppliers or subcontractors, and any other amounts which OWNER is permitted to deduct by law or pursuant to any provisions of the Contract Documents.

14.05 *Partial Utilization*

A. Use by OWNER at OWNER's option of any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which OWNER, ENGINEER, and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following conditions.

1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and

substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, the provisions of paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

2. No occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of paragraph 5.10 regarding property insurance.

3. OWNER may at any time request CONTRACTOR in writing to permit OWNER to take over operation of any such part of the Work although it is not substantially complete. A copy of such request will be sent to ENGINEER and within a reasonable time thereafter OWNER, CONTRACTOR and ENGINEER shall make an inspection of that part of the Work to determine its status of completion and will prepare a list of the items remaining to be completed or corrected thereon before final payment. If CONTRACTOR does not object in writing to OWNER and ENGINEER that such part of the Work is not ready for separate operation by OWNER, ENGINEER will finalize the list of items to be completed or corrected and will deliver such lists to OWNER and CONTRACTOR together with a written recommendation as to the division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security.

operation, safety, maintenance, utilities, insurance, warranties and guarantees for that part of the Work which will become binding upon OWNER and CONTRACTOR at the time when OWNER takes over such operation (unless they shall have otherwise agreed in writing and so informed ENGINEER). During such operation and prior to Substantial Completion of such part of the Work, OWNER shall allow CONTRACTOR reasonable access to complete or correct items on said list and to complete other related Work.

14.06 *Final Inspection*

A. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will promptly make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment*

1. After CONTRACTOR has, in the opinion of ENGINEER, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in paragraph 6.12), and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by: (I) all documentation called for in the Contract

Documents, including but not limited to the evidence of insurance required by subparagraph 5.04.B.7; (ii) consent of the surety, if any, to final payment.; and (iii) ~~complete and legally effective releases or waivers (satisfactory to OWNER) of all Lien rights arising out of or Liens filed in connection with the Work.~~

~~3. In lieu of the releases or waivers of Liens specified in paragraph 14.07.A.2 and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: (I) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.~~

B. *Review of Application and Acceptance*

1. If, on the basis of ENGINEER's observation of the Work during construction and final inspection, and ENGINEER's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application for Payment to OWNER for payment. At the same time ENGINEER will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph

14.09. Otherwise, ENGINEER will return the Application for Payment to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

1. ~~Thirty days~~ After the presentation to OWNER of the Application for Payment and accompanying documentation, the amount recommended by ENGINEER will become due and, when due, will be paid by OWNER to CONTRACTOR in accordance with the Louisiana Public Contract Statute.

2. Following acceptance of the Work by OWNER, CONTRACTOR shall file the acceptance with the Clerk of Court and Ex-Officio Recorder of Mortgages.

3. Release and payment of Retainage, or balance due, will become due and will be paid by OWNER to CONTRACTOR thirty days after receipt of Application for Retainage Payment (which must include a clear lien and privilege certificate secured from the Clerk of Court and Ex-Officio Recorder of Mortgages dated no less than forty-five (45) days after the filing of the acceptance and other documentation as required by the Contract Documents), and recommendation of payment by ENGINEER.

14.08 Final Completion Delayed

A. If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining

balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims. The completion of the various items may not be a requirement for Substantial Completion.

14.09 Waiver of Claims

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by OWNER against CONTRACTOR, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by CONTRACTOR against OWNER other than those previously made in writing which are still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 OWNER May Suspend Work

A. At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be

allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if CONTRACTOR makes a Claim therefor as provided in paragraph 10.05.

15.02 *OWNER May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. CONTRACTOR's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.07 as adjusted from time to time pursuant to paragraph 6.04);

2. CONTRACTOR's disregard of Laws or Regulations of any public body having jurisdiction;

3. CONTRACTOR's disregard of the authority of ENGINEER; or

4. CONTRACTOR's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in paragraph 15.02.A occur, OWNER may, after giving CONTRACTOR (and the surety, if any) seven days written notice, terminate the services of CONTRACTOR, exclude CONTRACTOR from the Site, and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case, CONTRACTOR shall not be

entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by OWNER arising out of or relating to completing the Work, such excess will be paid to CONTRACTOR. If such claims, costs, losses, and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses, and damages incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and, when so approved by ENGINEER, incorporated in a Change Order. When exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

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

15.03 *OWNER May Terminate For Convenience*

A. Upon seven days written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Contract. In such case, CONTRACTOR shall be paid (without duplication of any items):

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

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

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

4. for reasonable expenses directly attributable to termination.

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

15.04 *CONTRACTOR May Stop Work or Terminate*

A. If, through no act or fault of CONTRACTOR, the Work is suspended for more than 90 consecutive days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within 30 days after it is submitted, or OWNER fails for 30 days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days written notice to OWNER and ENGINEER, and provided OWNER or ENGINEER do not remedy such suspension or failure within that time, terminate the Contract and recover from OWNER payment on the same terms as provided in paragraph 15.03. In lieu of terminating the Contract and without prejudice to any other right or remedy, if ENGINEER has failed to act on an Application for Payment within 30 days after it is submitted, or OWNER has failed for 30 days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may,

seven days after written notice to OWNER and ENGINEER, stop the Work until payment is made of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph 15.04 are not intended to preclude CONTRACTOR from making a Claim under paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to CONTRACTOR's stopping the Work as permitted by this paragraph.

~~ARTICLE 16 - DISPUTE RESOLUTION~~

~~16.01 *Methods and Procedures*~~

~~A. Dispute resolution methods and procedures, if any, shall be as set forth in the Supplementary Conditions. If no method and procedure has been set forth, and subject to the provisions of paragraphs 9.09 and 10.05, OWNER and CONTRACTOR may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.~~

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of

the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto and, in particular but without limitation, the warranties, guarantees, and obligations imposed upon CONTRACTOR hereunder and all of the rights and remedies available to OWNER and ENGINEER thereunder are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Agreement.

B. Nothing herein, in the Agreement, or any of the other Contract Documents shall be construed as a waiver, modification, or alteration of the CONTRACTOR's or its surety's obligations under La. R.S. 38:2189. Nothing in this paragraph or any other

provision in the General Conditions or other Contract Documents concerning any specific time periods shall establish a period of limitation with respect to any other obligation which CONTRACTOR has under the Contract Documents. The establishment of time periods relates only to the specific obligations of CONTRACTOR to correct the Work, and has no relationship to the time within which CONTRACTOR's obligations under the Contract Documents may be sought to be enforced, nor to the time within which the proceedings may be commenced to establish CONTRACTOR's liability with respect to CONTRACTOR's obligations other than specifically to correct the Work.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

EXHIBIT A

Duties, Responsibilities and Limitations of Authority of Resident Project Representative

ENGINEER shall furnish a Resident Project Representative ("RPR"), assistants and other field staff to assist ENGINEER in observing progress and quality of the work of CONTRACTOR.

Through more extensive on-site observations of the Work in progress and field checks of materials and equipment by the RPR and assistants, ENGINEER shall endeavor to provide further protection for OWNER against defects and deficiencies in the work of CONTRACTOR. However, ENGINEER shall not, during such visits or as a result of such observations of CONTRACTOR's work in progress, supervise, direct, or have control over CONTRACTOR's work nor shall ENGINEER have authority over or responsibility for the means, methods, techniques, sequences or procedures selected by CONTRACTOR, for safety precautions and programs incident to the work of CONTRACTOR, for any failure of CONTRACTOR to comply with laws, rules, regulations, ordinances, codes or orders applicable to CONTRACTOR's performing and furnishing the work, or responsibility of construction for CONTRACTOR's failure to furnish and perform the Work in accordance with the Contract Documents.

The duties and responsibilities of the RPR are limited to those of ENGINEER in ENGINEER's agreement with the OWNER and in the construction Contract Documents, and are further limited and described as follows:

A. General

RPR is ENGINEER's agent at the Site, will act as directed by and under the supervision of ENGINEER, and will confer with ENGINEER regarding RPR's actions. RPR's dealings in matters pertaining to the on-site Work shall in general be with ENGINEER and CONTRACTOR, keeping OWNER advised as necessary. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of CONTRACTOR. RPR shall generally communicate with OWNER with the knowledge of and under the direction of ENGINEER.

B. Duties and Responsibilities of RPR

1. *Schedules:* Review the progress schedule, schedule of Shop Drawing submittals and schedule of values prepared by CONTRACTOR and consult with ENGINEER concerning acceptability.
2. *Conferences and Meetings:* Attend meetings with CONTRACTOR, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.

3. *Liaison:*

- a. Serve as ENGINEER's liaison with CONTRACTOR, working principally through CONTRACTOR's superintendent and assist in understanding the intent of Contract Documents; and assist ENGINEER in serving as OWNER's liaison with CONTRACTOR when CONTRACTOR's operations affect OWNER's on-site operations.
- b. Assist in obtaining from OWNER additional details or information, when required for proper execution of the Work.

4. *Shop Drawings and Samples:*

- a. Record date of receipt of Shop Drawings and Samples.
- b. Receive Samples, which are furnished at the Site by CONTRACTOR, and notify ENGINEER of availability of Samples for examination.
- c. Advise ENGINEER and CONTRACTOR of the commencement of any Work requiring a Shop Drawing or Sample if the submittal has not been approved by ENGINEER.

5. *Review of Work, Rejection of Defective Work, Inspections and Tests:*

- a. Conduct on-site observations of the Work in progress to assist ENGINEER in determining if the Work is in general proceeding in accordance with the Contract Documents.
- b. Report to ENGINEER whenever RPR believes that any Work will not produce a completed Project that conforms generally to the Contract Documents or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise ENGINEER of Work that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
- c. Verify that tests, equipment and systems start-ups and operating and maintenance training are conducted in the presence of appropriate personnel, and that CONTRACTOR maintains adequate records thereof; and observe, record and report to ENGINEER appropriate details relative to the test procedures and start-ups.
- d. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to ENGINEER.

6. *Interpretation of Contract Documents:* Report to ENGINEER when clarifications and interpretations of the Contract Documents are needed and transmit to CONTRACTOR clarifications and interpretations as issued by ENGINEER.

7. *Modifications:* Consider and evaluate CONTRACTOR's suggestions for modifications in Drawings or Specifications and report with RPR's recommendations to ENGINEER. Transmit to CONTRACTOR in writing decisions as issued by ENGINEER.

8. *Records:*

a. Maintain at the job Site orderly files for correspondence, reports of job conferences, Shop Drawings and Samples, reproductions of original Contract Documents including all Work Change Directives, Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Contract, ENGINEER's clarifications and interpretations of the Contract Documents, progress reports, Shop Drawing submittals received from and delivered to CONTRACTOR and other Project related documents.

b. Prepare a daily report or keep a diary or log book, recording CONTRACTOR's hours on the job site, weather conditions, data relative to questions of Work Change Directives, Change Orders or changed conditions, list of job Site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to ENGINEER.

c. Record names, addresses and telephone numbers of all contractors, subcontractors and major suppliers of materials and equipment.

9. *Reports:*

a. Furnish to ENGINEER periodic reports as required of progress of the Work and of CONTRACTOR's compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.

b. Consult with ENGINEER in advance of scheduled major tests, inspections or start of important phases of the Work.

c. Draft proposed Change Orders and Work Change Directives, obtaining backup material from CONTRACTOR and recommend to ENGINEER Change Orders, Work Change Directives, and Field Orders.

d. Report immediately to ENGINEER and OWNER the occurrence of any accident.

10. *Payment Requests:* Review Applications for Payment with CONTRACTOR for compliance with the established procedure for their submission and forward with recommendations to ENGINEER, noting particularly the relationship of the payment requested to the schedule of values, Work completed and materials and equipment delivered at the Site but not incorporated in the Work.

11. *Certificates, Maintenance and Operation Manuals:* During the course of the Work, verify that certificates, maintenance and operation manuals and other data

required to be assembled and furnished by CONTRACTOR are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to ENGINEER for review and forwarding to OWNER prior to final payment for the Work.

12. *Completion:*

a. Before ENGINEER issues a Certificate of Substantial Completion, submit to CONTRACTOR a list of observed items requiring completion or correction.

b. Observe whether CONTRACTOR has had performed inspections required by laws, rules, regulations, ordinances, codes, or orders applicable to the Work, including but not limited to those to be performed by public agencies having jurisdiction over the Work.

c. Conduct a final inspection in the company of ENGINEER, OWNER and CONTRACTOR and prepare a final list of items to be completed or corrected.

d. Observe whether all items on final list have been completed or corrected and make recommendations to ENGINEER concerning acceptance and issuance of the Notice of Acceptability of the Work.

C. Limitations on Authority of RPR

Resident Project Representative:

1. Shall not authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items), unless authorized by ENGINEER.

2. Shall not exceed limitations of ENGINEER's authority as set forth in the Agreement or the Contract Documents.

3. Shall not undertake any of the responsibilities of CONTRACTOR, Subcontractor, Suppliers, or CONTRACTOR's superintendent.

4. Shall not advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the Contract Documents.

5. Shall not advise on, issue directions regarding or assume control over safety precautions and programs in connection with the Work.

6. Shall not accept Shop Drawing or Sample submittals from anyone other than CONTRACTOR.

7. Shall not authorize OWNER to occupy the Project in whole or in part.

8. Shall not participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by ENGINEER.

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC No. 1910-8) (1996 Edition) as edited for Jefferson Parish Law Enforcement District and other provisions of the Contract Documents as indicated below. All Provisions of the Standard General Conditions which have not been amended or supplemented as indicated by strikeout or underlining in the text of the Standard General Conditions or which are not so amended or supplemented herein remain in full force and effect:

SC-1. Definitions

The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract (EJCDC No. 1910-8) (1996 Edition) as edited for Jefferson Parish Law Enforcement District have the meanings assigned to them in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings indicated below which are applicable to both the singular and plural thereof. Articles, Paragraphs, Subparagraphs or clauses modified have the same numerical designation as those occurring in the General Conditions.

SC-4.01.

The CONTRACTOR is advised that access to any or all of the following portions of the Project may be delayed by as much as six months from the date on which the Contract Times will commence to run. The areas are:

JOB SPECIFIC
(include specific location
identifications)

The CONTRACTOR must adjust his schedule of operations accordingly. No additional monetary compensation will be granted to the CONTRACTOR resulting from this delay. The Contract Times will be adjusted accordingly, as provided in Article 12 of the General Conditions.

SC-4.02.

Add the following new paragraphs after paragraph 4.02.B and before paragraph 4.02.F:

C. In the preparation of the Drawings and Specifications, ENGINEER or ENGINEER's Consultants relied upon the following reports of explorations and tests of subsurface conditions at the Site:

Report dated _____, 20 ____ prepared by _____ (name) _____, _____ (city/state), entitled: _____ (title of report) _____ consisting of _____ pages. The technical data contained in such report upon which CONTRACTOR may rely is _____.

Report dated _____, 20 ____ prepared by _____ (name) _____ (city/state), entitled: _____ (title of report) _____ consisting of _____ pages. The technical data contained in such report upon which CONTRACTOR may rely is _____.

D. In preparation of the Drawings and Specifications, ENGINEER or ENGINEER'S consultant relied upon the following drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the Site:

Drawings dated _____, 20 ____, prepared by _____ (name) _____, _____ (city/state) _____, entitled: _____ (title of drawings) _____, consisting of _____ sheets, numbered _____ to _____, inclusive. All of the information in such drawings constitutes technical data appearing on drawing No. _____ and appearing on Drawing No. _____.

E. Copies of reports and drawings itemized in SC-4.02.C and D that are not included with Bidding Documents may be examined at _____ during regular business hours. These reports and drawings are not part of the Contract Documents, but the technical data contained therein upon which CONTRACTOR is entitled to rely as identified and established above are incorporated therein by reference. CONTRACTOR is not entitled to rely upon other information and data utilized by ENGINEER and ENGINEER's Consultants in the preparation of Drawings and Specifications.

SC-5.0.4.

In accordance with the provisions of 5.04(C)(5) and 5.04(C)(6)(c) the following modifications or waivers of the coverage requirements of 5.04 are authorized pursuant to those provisions:
(insert any changes)

SC-14.02.A.4.

Pursuant to the reference in paragraph 14.02.A.4.a of the Standard General Conditions, the aggregate cost of materials stored offsite shall not at any time exceed \$ _____, without the written approval of the OWNER.

SC-18. Non-Work Days

Non-work days shall be defined as days in which the CONTRACTOR worked less than four (4) hours due to inclement weather conditions.

SC-19. Time Extensions for Weather Conditions

The CONTRACTOR acknowledges and agrees that weather conditions shall not be an automatic cause for time extension. The Contract Times specified in the Bidding Documents and Contract Documents include an allowance as stated in those documents for inclement weather. In order to document and claim days lost to inclement weather conditions, the CONTRACTOR shall, on a semi-monthly basis, submit a report to the ENGINEER, stating the time lost to inclement weather, within seven (7) days of the end of the report period. The ENGINEER will review the report for submittal to the OWNER within seven days of receipt of the report and make recommendations for either acceptance or rejection of each claimed time period lost to inclement weather. The OWNER will then instruct the ENGINEER to approve or reject the report. There shall be no additional compensation due the CONTRACTOR for inclement weather days allowed hereunder.

The report for lost days due to inclement weather shall account for all days during the reporting period, including weekends and holidays. Claims for lost days on either weekends or holidays will not be considered unless the CONTRACTOR can show that the inclement weather affected work production on the following workday. The reporting periods shall be from the first day of the month through and including the last day of the month. Lost time accounting shall be in one-half day increments.

Lost time shall be considered only if the weather occurrence is in excess of the normal weather patterns as established by the nearest office of the National Weather Service, U.S. Department of Commerce. When the Contract utilizes critical path method (CPM) scheduling, the ENGINEER

will determine if the days lost due to weather conditions actually affected the critical path activities. If weather conditions did not affect the progress of the critical path activities, no time extension will be granted.

SC-20 REMOVAL AND DISPOSAL OF STRUCTURES AND OBSTRUCTIONS

A. General

The CONTRACTOR shall remove any existing structure or part of structure, fence, building, or other encumbrances or obstructions that interfere in any way with the new construction. Compensation for the removal of any structure not listed as a pay item in the Proposal and with a Contract Bid Price shall be included in the Contract unit prices bid for the pay items of the Work.

B. Privately and Publicly Owned Materials

If called for in the Special Conditions, all privately and publicly owned materials in structures removed shall be salvaged without damage and shall be piled neatly and in an acceptable manner upon the premises if it belongs to an abutting property owner, otherwise at accessible points along the improvements. Material in structures which is property of the OWNER or property of any public body, private body, or individual which is fit for use elsewhere, shall remain property of the original owner. It shall be carefully removed without damage, in sections, which may be readily transported, and shall be piled neatly in an accessible point by the CONTRACTOR. When materials of OWNER, State, Municipality, or Parish are stored on or beyond the right of way, the CONTRACTOR will be held responsible for their care and preservation for a period of ten (10) days following the day the last or final portion of the materials stored at a particular location are placed thereon. When privately owned materials are stored beyond the right of way, the CONTRACTOR will be held responsible for their care and preservation for a period of ten (10) days (computed as set forth above); provided, however, that as of the day the ten (10) days responsibility period for care and preservation of the materials begins, the CONTRACTOR must furnish the ENGINEER with evidence satisfactory to the latter that the proper owner of the materials has been duly notified by the CONTRACTOR that the said owner must assume responsibility for his materials on the date following the CONTRACTOR's ten (10) day responsibility.

SC-21 PUBLIC CONVENIENCE AND SAFETY

A. Care of Traffic

No road shall be closed by the CONTRACTOR to the public except by written permission of the Engineer and/or Architect, and except while so closed, the CONTRACTOR shall maintain traffic over, through, or around the work included in his Contract, with the maximum practical convenience, for the full twenty-four hours of each day of the Contract, whether or not work has ceased temporarily. The CONTRACTOR shall notify the ENGINEER at the earliest possible date after the Contract has been executed, and in any case before the starting of any construction that might in any way inconvenience or endanger traffic, so that the necessary arrangements may be determined.

B. General Public

The convenience of the general public and of residents along the Work shall be provided for in a reasonable adequate and satisfactory manner. Where existing roads are not available for

use as detours, unless otherwise provided, all traffic shall be permitted to pass through the Work. In such cases the vehicles of the traveling public shall have precedence over CONTRACTOR's vehicles to the end that the traveling public's vehicles shall not be unduly delayed for the convenience of the CONTRACTOR. In order that all unnecessary delay to the traveling public may be avoided, where ordered by the ENGINEER, the CONTRACTOR shall provide and station competent flagmen whose sole duties shall consist of directing and controlling the movement of public traffic either through or around the Work.

C. Temporary Roads, Driveways, etc.

The CONTRACTOR shall provide and maintain, in a manner approved and deemed practicable by the ENGINEER, such temporary roads as may be necessary to provide convenient access to driveways, houses, buildings, or other property abutting the work. Where temporary bridges are necessary for traffic and pedestrians, these bridges shall be constructed at the expense of the CONTRACTOR as directed by the ENGINEER.

D. Arranging the Work

The CONTRACTOR shall arrange his work so that no undue or prolonged blocking of business establishments will occur.

E. Storage of Materials

Materials and equipment stored on the right of way or Project Site shall be so placed and the Work at all times shall be so conducted as to insure minimum danger and obstruction to the traveling public.

F. Control During Work

During grading operations where traffic is being permitted to pass through construction, the CONTRACTOR shall provide a smooth, even surface that will provide a satisfactory passageway for use of traffic. The roadbed shall be sprinkled with water if necessary to prevent a dust nuisance, provided the dust nuisance is a result of the Work.

G. Fire Protection

Fire hydrants shall be accessible at all times to the Fire Department. No material or other obstructions shall be placed closer to a fire hydrant than permitted by ordinances, rules, or regulations or within fifteen (15') feet of a fire hydrant, in the absence of such ordinances, rules, or regulations.

~~SC-22 STRUCTURES AT RAILROAD CROSSINGS~~

A. ~~Notification~~

~~No Work of any character shall be commenced on railroad right of way until the Railroad Company has issued a permit to the OWNER and has been duly notified by the CONTRACTOR in writing (with a copy forwarded to the ENGINEER) of the date he proposes to begin work, and until an authorized representative of the Railroad Company is present, unless the Railroad Company waives such requirement.~~

B. Inspection by Railroad Company

~~All Work performed by the CONTRACTOR within the right of way limits of the railroad shall be subject to the inspection and approval of the chief engineer of the Railroad Company, or his authorized representative and any precautions considered necessary by said chief engineer to safeguard the property, equipment, employees, and passengers of the Railroad Company shall be taken by the CONTRACTOR without extra compensation.~~

C. Cooperation with Railroad Company

~~The CONTRACTOR shall, without extra compensation, take such precautions and erect and maintain such telltale or warning devices as the Railroad Company considers necessary to safeguard the operation of its trains. The temporary vertical and horizontal clearances specified by the chief engineer of the Railroad Company in approving these shall be maintained at all times. No steel, brick, pipe, or any other loose material shall be left on the ground in the immediate vicinity of the railway tracks.~~

D. Insurance

~~Before any Work is done within Railroad right of way, the CONTRACTOR shall provide and pay all costs of any special insurance requirements of the Railroad.~~

SC-23 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE

A. CONTRACTOR's Responsibility

The CONTRACTOR shall not enter upon private property for any purpose without first obtaining permission from the owners and lessees. The CONTRACTOR shall use every precaution necessary for the preservation of all public and private property, monuments, highway signs, telephone lines, other utilities, etc., along and adjacent to the Work; shall use every precaution necessary to prevent damage to pipes, conduits, and other underground structures; and shall protect carefully from disturbance or damage all land monuments and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed. The street and highway signs and markers that are to be affected by the Work shall be carefully removed when the Work begins and stored in a manner to keep them clean and dry. The CONTRACTOR must obtain all necessary information in regard to existing utilities, and shall give notice in writing to the owners or the proper authorities in charge of streets, gas, water, pipes, electric, sewers, and other underground structures, including conduits, railways, poles and pole lines, manholes, catch basins, fixtures, appurtenances, and all other property that may be affected by the CONTRACTOR's operations, at least forty-eight (48) hours before his operations will affect such property. The CONTRACTOR shall not hinder or interfere with any person in the protection of such work or with the operation of utilities, at any time. When property or the operation of railways, telephone lines, telegraph lines, or other public utilities are endangered, the CONTRACTOR shall, at his own expense, maintain flagmen or watchmen and any other necessary precautions to avoid interruption of service or damage to life or property, and he shall promptly repair, restore, or make good any injury or damage caused by his negligent operations in an acceptable manner. The CONTRACTOR must also obtain all necessary information in regard to the installation of new cables, conduits, and transformers, and make proper provision and give proper notifications, so that these can be installed at the proper time without delay to the CONTRACTOR or unnecessary inconvenience to the OWNER.

B. Undercutting Buildings

Where provided in Special Conditions, when the work involves the undercutting of any buildings along the Work, the CONTRACTOR must give property owners and lessees due and sufficient notice of the undercutting and the CONTRACTOR shall adequately support such buildings. The CONTRACTOR and his Surety shall hold the OWNER and their representatives harmless from any damages resulting from undercutting any such buildings.

C. Trees, Shrubs, Plants, or Grass

The CONTRACTOR shall not remove, injure, cut, or destroy trees, shrubs, plants, or grass that are to remain in the streets or those which are privately owned, without proper authority. Unless otherwise provided in the Special Provisions or the Proposal, the CONTRACTOR shall replace and replant all plants, shrubs, and grass and restore the grounds back to its original good condition to the satisfaction of the OWNER and property owner. The CONTRACTOR shall assume the responsibility of replanting and guarantees that plants, shrubs, and grass will be watered, fertilized, and cultivated until they are in a growing condition. No direct payment will be made for removing and replanting of trees, shrubs, plants, or grass unless such items are set forth in the Proposal.

D. Reparation

When or where any direct damage or injury is done to public or private property by or on account of any negligent act, omission, neglect, or otherwise of the CONTRACTOR, he shall make good such damage or injury in an acceptable manner. In case of failure on the part of the Contractor to restore such property or make good such damage, the Owner may upon forty-eight (48) hours' notice proceed to repair, rebuild, or otherwise restore such property as may be deemed necessary, and the cost thereof will be deducted from any monies due or which may become due under the Contract. The Contractor shall indemnify and save harmless the Owner, or the Design Professional acting in behalf of the Owner, from all suits and actions that may be brought against it by reason of any injury, or alleged injury, to the person or property of another resulting from negligence or carelessness in the execution of the Work, or on account of any negligent act or omission, or from improper methods or means of construction on the part of the Contractor, his representatives, or employees. The Contractor shall have the sole responsibility of determining the best and proper method or means of construction and the Owner, or the Design Professional acting on behalf of the Owner, shall not be held responsible for determining or suggesting a method or means of construction, except as expressly indicated in the Contract Documents

SC-24 BARRICADES, DANGER, WARNING, AND DETOUR SIGNS

A. General

The CONTRACTOR shall, without extra compensation, provide, erect, paint, and maintain all necessary barricades. Also without extra compensation, the CONTRACTOR shall provide suitable and sufficient lights, torches, reflectors, or other danger signals and signs, provide a sufficient number of watchmen and flagmen, and take all necessary precautions for the protection of the Work and safety of the public.

B. Warning Signs, Painting, Illumination

The CONTRACTOR shall erect warning signs beyond the limits of the Project, sufficiently in advance of any place on the Project where operations interfere with the use of the road by traffic, including all intermediate points where the new Work crosses or coincides with the existing road. Barricades shall be kept well painted and suitable warning signs shall be placed thereon. All

barricades and obstructions shall be illuminated at night and all lights or devices for this purpose shall be kept burning from sunset to sunrise.

C. Hazards and Compensation

Whenever traffic is maintained through or over any part of the project, the CONTRACTOR shall clearly mark all traffic hazards. No direct payment will be made for barricades, signs, and illumination therefor, or for watchmen or flagmen.

SC-25 AFFIDAVIT ATTESTING THAT PUBLIC CONTRACT NOT SECURED THROUGH EMPLOYMENT OR PAYMENT OF SOLICITOR (LSA R.S. 38:2224)

The CONTRACTOR warrants that (1) he has not employed or retained any person, corporation, firm, association, company or other organization, either directly or indirectly, to secure this Contract, other than persons regularly employed by the CONTRACTOR and whose services were in the regular course of their duties for the CONTRACTOR and (2) that no part of the Contract Price received by CONTRACTOR was paid or will be paid to any person, corporation, firm, association, company or other organization, either directly or indirectly any fee, commission, percentage, brokerage fee, gifts, or any other consideration, contingent upon or resulting from the award or making of this Contract or to solicit or secure this Contract, other than the payment of their normal compensation to persons regularly employed by the CONTRACTOR whose services in connection with this Contract were in the regular course of their duties for CONTRACTOR. For breach or violation of this warranty, the OWNER shall have the right to annul this Contract without liability.

SC-26 ARBITRATION

It is agreed and understood that the OWNER does not submit to arbitration and any provision(s) to the contrary shall be null and void.

SC-27 HISTORICAL OR ARCHAEOLOGICAL DEPOSITS

If, during the course of construction, evidence of deposits of historical or archaeological interest is found, CONTRACTOR shall cease operations affecting the find and shall notify OWNER, who shall notify the State Historic Preservation Officer. No further disturbance of the deposits shall ensue until CONTRACTOR has been notified by OWNER that he may proceed. OWNER will issue a notice to proceed only after the state official has surveyed the find and made a determination to the OWNER. Compensation to CONTRACTOR, if any, for lost time or changes in construction to avoid the find, shall be determined in accordance with changed conditions or Change Order provisions of the Contract Documents.

SC-28 ADDITIONAL LIQUIDATED DAMAGES

In accordance with ARTICLE VII of the Agreement, the following amounts shall be due the OWNER pursuant to determinations made under ARTICLES VI and VII for each of the following items:

- (1) Extended architectural and/or engineering fees \$_____;
- (2) Extended Resident Project Representative fees \$_____;
- (3) Extended construction management fees \$_____;
- (4) Extended OWNER'S overhead and personnel expenses \$_____; and
- (5) Owner's other costs directly related to the delay in completion beyond the Contract

Times.

SC-29 REMOVAL/RELOCATION OF TREES ON PUBLIC PROPERTY

The Director of the Jefferson Parish Parkways Department shall be contacted and advised of trees that are on public property prior to the removal/relocation of such trees by the CONTRACTOR. Furthermore, the Department of Parkways shall be given a reasonable period of time to respond and when necessary remove the trees.

SC-30 ROAD CLOSURE

In the event that it becomes necessary to close any roadway or partially close any major road due to scheduled construction work being performed by CONTRACTOR the public must be notified and made aware of the closure in a timely manner.

In order to utilize both the print and electronic media to disseminate this information to the public, the Jefferson Parish Public Information Office must receive pertinent information from the CONTRACTOR concerning the closure.

Notice of a road closure or partial road closure of a major road must be sent to Jefferson Parish in care of its Public Information Officer, 1221 Elmwood Park Blvd., Suite 1002, Jefferson, Louisiana 70123.

THAT NOTIFICATION MUST CONTAIN THE FOLLOWING INFORMATION AND MUST BE RECEIVED BY THE PUBLIC INFORMATION OFFICE AT LEAST 10 DAYS PRIOR TO THE SCHEDULED CLOSURE:

- a.) Name of the contractor, engineer, etc., involved in the work/project who is responsible for the action.
- b.) A brief description of the project (Example: "...drain line installation," "...to remove and replace concrete slabs," etc.)
- c.) The date and time the action will take place and when re-opening is scheduled. (Example. "...will be closed from 6 a.m. on Friday, July 23, 1999 to 8 p.m. on Monday, July 26, 1999.")
- d.) The exact location of action. (Example: "...closed on David Drive from W. Napoleon Avenue to Veterans Memorial Boulevard," or "...the 900 block of David Drive")
- e.) Define the action that will be taken. (Example: eastbound, westbound, inside or outside lanes or both, etc.)
- f.) If the roadway will be closed completely to traffic and a detour will be in effect, a map illustrating the detour route must accompany the information.
- g.) Contact person for additional information.

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Project information.
 - 2. Work covered by Contract Documents.
 - 3. Access to site.
 - 4. Work restrictions.
 - 5. Specification and drawing conventions.
 - 6. Miscellaneous provisions.

- B. Related Requirements:

- 1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities and required temporary enclosures.

1.3 PROJECT INFORMATION

- A. Project Identification: Jefferson Parish Sheriff's Office Warehouse Tornado Repairs.

- 1. Project Location: 1801 Westbank Expressway, Harvey, LA 70058.

- B. Owner: Jefferson Parish Law Enforcement District

- 1. Owner's Representative: Byron Champagne, JPSO Contracts Manager (504) 598-5111

C. Architects, Structural and Civil Engineers:

N-Y Associates, Engineers, Architects, Planners, Program & Project Managers
2750 Lake Villa Dr.
Metairie, LA 70002
Tel.: (504) 885-0500
FAX: (504) 885-0595

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Construct a new roof structure consisting of new structural steel beams, columns, joists, and metal decking.
2. Supply and install a new metal roof system consisting of new Zee Lock standing seam metal roofing over a peel and stick ice and water shield on dens deck board.
3. Supply and install new formed metal panel soffits and fascia wall panels per the drawings.
4. Supply and install new HVAC units over the existing shooting range per the MEP drawings.
5. Renovate the interior office area of the shooting range per the drawings.
6. Construct a new washroom in the existing Warehouse per the drawings.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

C. Before commencing Work of each consecutive phase, submit an updated copy of Contractor's construction schedule showing the sequence, commencement and completion dates, and move-out and -in dates of Owner's personnel for all phases of the Work.

1.5 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Limits of Construction; Confine construction operations to project site.
2. Contractor's approved by the Owner.
3. Public Walkways: Keep walkways serving premises clear and available to public at all times. Barricade construction as specified in other sections.
4. Do not block drives, parking areas and lawn areas.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work on the existing site to normal business working hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, unless otherwise indicated.
 - 1. Weekend Hours: 7:00 a.m. to 6:00 p.m.
 - 2. Early Morning Hours: Coordinate with owner.
 - 3. Hours for Utility Shutdowns: After hours and coordinate with owner.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Architect, Owner's Representative not less than two days in advance of proposed utility interruptions.
 - 2. Obtain Owner's Representative written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Architect, Owner's Representative not less than two days in advance of proposed disruptive operations.
 - 2. Obtain Owner's Representative not less than **two** days written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the existing work area and building.
- F. Controlled Substances: Use of tobacco products and other controlled substances within the new building or on the Project site is not permitted.
- G. Employee Identification: Owner will provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- H. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
 - 1. Maintain list of approved screened personnel with Owner's representative.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.8 MISCELLANEOUS PROVISIONS

- A. Building Permit: Building Permit will be paid by the Contractor.
- B. State Review Permit: Louisiana State Fire Marshal Architectural Review Permit will be paid by the Owner.
- C. The General Contractor shall pay the cost of all other Inspections Fees and other Fees as required to complete the Work, and as indicated in the Contract for Construction and General and Supplemental Conditions.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Requests for Substitution of Materials shall in the possession of the Architect a minimum of 15 days prior to the bid date. Requests received after the 15 days shall be ignored and not receive a review. The Contractor shall be cognizant of and responsible for submitting within the proper time prior to the bid.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. All requests for substitutions shall be PIOR to THE BID within the time frame stated above. No substitutions will be considered after the time limit or after the bid.
- C. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

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

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A facsimile of form provided in Project Manual.

2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later. Only substitutions that appear in subsequent Addenda shall be recognized as valid substitutions.
 - a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

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

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions at no additional cost to the Owner

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

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

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract Award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions", or other form designated by the Owner.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in the Work Change Proposal Request or 20 days, when not otherwise specified, after receipt of the Work Change Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.

- d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail," forms provided by Owner, or forms acceptable to Architect. Sample copies are included in Project Manual.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, or the Work, Contractor may submit a Proposal Request for a change to Architect.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Include costs of labor and supervision directly attributable to the change.
 - 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 - 7. Proposal Request Form: Use CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail," form provided by Owner, or form acceptable to Architect. Sample copy is included in Project Manual.

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, recommended by the Architect, the Architect will issue a Change Order for signatures of Owner and Contractor on the form provided by the Owner.

CONSTRUCTION DOCUMENT 100% SUBMITTAL
JEFFERSON PARISH SHERIFF'S OFFICE
WAREHOUSE TORNADO REPAIRS

JUNE 9, 2023
N-Y JOB NO.: 21023

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

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

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. Cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the schedule of values.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
 4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
 5. Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract as described in Section 011000 "Summary."
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
10. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
11. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the seventh day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E. Application for Payment Forms: Use forms provided by Owner for Applications for Payment. Sample copies are included in Project Manual.
- F. Application for Payment Forms: Use forms acceptable to Architect and Owner for Applications for Payment. Submit forms for approval with initial submittal of schedule of values.

- G. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- H. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- I. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- J. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

- K. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- L. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. LEED submittal for project materials cost data.
 4. Contractor's construction schedule (preliminary if not final).
 5. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
 6. Products list (preliminary if not final).
 7. LEED action plans.
 8. Schedule of unit prices.
 9. Submittal schedule (preliminary if not final).
 10. List of Contractor's staff assignments.
 11. List of Contractor's principal consultants.
 12. Copies of building permits.
 13. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 14. Initial progress report.
 15. Report of preconstruction conference.
 16. Certificates of insurance and insurance policies.
 17. Performance and payment bonds.
 18. Data needed to acquire Owner's insurance.
- M. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

N. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project Web site.
 - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 011200 "Multiple Contract Summary" for a description of the division of work among separate contracts and responsibility for coordination activities not in this Section.
 - 2. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 3. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 4. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.
 - 5. Section 019113 "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, which depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - f. Indicate required installation sequences.
 - g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
9. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

- C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
 - 1. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.
 - 2. Digital Drawing Files: Should the Architect furnish Contractor digital data files of Drawings for use in preparing coordination digital data files, the Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
 - a. Contractor shall execute a data licensing agreement in the form of AIA Document C106 or an Agreement form acceptable to Owner and Architect

1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Architect.
 - 6. RFI number, numbered sequentially.
 - 7. RFI subject.
 - 8. Specification Section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.
 - 10. Field dimensions and conditions, as appropriate.
 - 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 12. Contractor's signature.
 - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716, form bound in Project Manual or Software-generated form with substantially the same content as indicated above, acceptable to Architect.

1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow **seven** working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within **10** days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly with the Application for Payment. Use CSI Log Form 13.2B, software log that is part of Project Web site or Software log with not less than the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
 - 1. Conduct the conference to review responsibilities and personnel assignments.
 - 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Preparation of record documents.
 - m. Use of the premises.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.
 - t. Construction waste management and recycling.
 - u. Parking availability.
 - v. Office, work, and storage areas.
 - w. Equipment deliveries and priorities.
 - x. First aid.
 - y. Security.
 - z. Progress cleaning.

4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of material samples, attic stock, and spare parts.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractor's punch list.
 - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - i. Submittal procedures.
 - j. Coordination of separate contracts.
 - k. Owner's partial occupancy requirements.
 - l. Installation of Owner's furniture, fixtures, and equipment.
 - m. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at monthly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:

- 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Temporary facilities and controls.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) Status of RFIs.
 - 15) Status of proposal requests.
 - 16) Pending changes.
 - 17) Status of Change Orders.
 - 18) Pending claims and disputes.
 - 19) Documentation of information for payment requests.
 4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- F. Coordination Meetings: Conduct Project coordination meetings regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.
1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

- c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Temporary facilities and controls.
 - 10) Work hours.
 - 11) Hazards and risks.
 - 12) Progress cleaning.
 - 13) Quality and work standards.
 - 14) Change Orders.
- 3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Periodic construction photographs.
 - 3. Final completion construction photographs.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting photographic documentation.
 - 2. Section 017700 "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.
 - 3. Section 024119 "Selective Structure Demolition" for photographic documentation before selective demolition operations commence.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For photographer.
- B. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
- C. Digital Photographs: Submit image files within three days of taking photographs.
 - 1. Digital Camera: Minimum sensor resolution of 8 megapixels.
 - 2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
 - 3. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect.

- d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - g. Unique sequential identifier keyed to accompanying key plan.
- D. Construction Photographs: Submit two prints of each photographic view within seven days of taking photographs.
 - 1. Format: 8-by-10-inch (203-by-254-mm) smooth-surface matte prints on single-weight, commercial-grade photographic paper; enclosed back to back in clear plastic sleeves that are punched for standard three-ring binder.
 - 2. Identification: On back of each print, provide an applied label or rubber-stamped impression with the following information:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date photograph was taken if not date stamped by camera.
 - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - g. Unique sequential identifier keyed to accompanying key plan.

1.4 QUALITY ASSURANCE

- A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.5 USAGE RIGHTS

- A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified photographer to take construction photographs.
- B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 1. Date and Time: Include date and time in file name for each image.
 - 2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.
- D. Preconstruction Photographs: Before commencement of excavation, commencement of demolition, and starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.
 - 1. Flag excavation areas, and construction limits before taking construction photographs.
 - 2. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
 - 3. Take 20 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
 - 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- E. Periodic Construction Photographs: Take 20 photographs weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- F. Architect-Directed Construction Photographs: From time to time, Architect will instruct photographer about number and frequency of photographs and general directions on vantage points. Select actual vantage points and take photographs to show the status of construction and progress since last photographs were taken.
- G. Time-Lapse Sequence Construction Photographs: Take 20 photographs as indicated, to show status of construction and progress since last photographs were taken.
 - 1. Frequency: Take photographs weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment.
 - 2. Vantage Points: Following suggestions by Architect and Contractor, photographer to select vantage points. During each of the following construction phases, take not less than

two of the required shots from same vantage point each time to create a time-lapse sequence as follows:

- a. Commencement of the Work, through completion of subgrade construction.
 - b. Above-grade structural framing.
 - c. Exterior building enclosure.
 - d. Interior Work, through date of Substantial Completion.
- H. Final Completion Construction Photographs: Take 20 color photographs after date of Substantial Completion for submission as project record documents. Architect will inform photographer of desired vantage points.
1. Do not include date stamp.
- I. Additional Photographs: Architect may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum.
1. Three days' notice will be given, where feasible.
 2. In emergency situations, take additional photographs within 24 hours of request.
 3. Circumstances that could require additional photographs include, but are not limited to, the following:
 - a. Special events planned at Project site.
 - b. Immediate follow-up when on-site events result in construction damage or losses.
 - c. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
 - d. Substantial Completion of a major phase or component of the Work.
 - e. Extra record photographs at time of final acceptance.
 - f. Owner's request for special publicity photographs.

END OF SECTION 013233

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 3. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 5. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 - 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 - 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled date of fabrication.
 - h. Scheduled dates for purchasing.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
 - 1. Architect will not furnish Contractor digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings without the Contractor first signing the Architect's standard Waiver for use of the drawings..
 - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.

- b. Digital Drawing Software Program: The Contract Drawings are available in AutoCAD Version 2016.
 - c. Contractor shall execute a data licensing agreement in the form of AIA Document C106, Digital Data Licensing Agreement, Agreement included in Project Manual or Agreement form acceptable to Owner and Architect.
 - d. The following digital data files will be furnished for each appropriate discipline:
 - 1) Floor plans.
 - 2) Reflected ceiling plans.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 - 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 - 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
 - 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification. It is reasonable that some submittals will need to be in paper form. In such case:
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.

3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Name of subcontractor.
 - f. Name of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return without review submittals received from sources other than Contractor.
 - a. Transmittal Form for Paper Submittals: Use AIA Document G810, or from acceptable to the Architect.
 - b. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
 - 1) Project name.
 - 2) Date.
 - 3) Destination (To:).
 - 4) Source (From:).
 - 5) Name and address of Architect.
 - 6) Name of Contractor.
 - 7) Name of firm or entity that prepared submittal.
 - 8) Names of subcontractor, manufacturer, and supplier.
 - 9) Category and type of submittal.
 - 10) Submittal purpose and description.
 - 11) Specification Section number and title.

- 12) Specification paragraph number or drawing designation and generic name for each of multiple items.
 - 13) Drawing number and detail references, as appropriate.
 - 14) Indication of full or partial submittal.
 - 15) Transmittal number, numbered consecutively.
 - 16) Submittal and transmittal distribution record.
 - 17) Remarks.
 - 18) Signature of transmitter.
- E. Electronic Submittals: Electronic transmittals are encouraged. The submittals shall be in PDF form that allows mark-ups by the Architect. Provide a method of notification to the Architect when they are submitted.
1. The PDF received shall be marked up and an electronic stamp shall be affixed with notations on the status of the review.
- F. Options: Identify options requiring selection by Architect.
- G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, and installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Action Submittals: Submit one digital three paper copies of each submittal unless otherwise indicated. Architect will return one marked up electronic copy two copies.

The Contractor will forward all necessary marked-up electronic copies to the subcontractors for revisions.

2. Informational Submittals: Submit one digital two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
 3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. One digital Three paper copies of Product Data unless otherwise indicated. Architect, will return one marked-up digital two copies.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
3. Submit Shop Drawings in the following format:

One digital Three opaque copies of each submittal. Architect will retain one two copies; remainder will be returned.

- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in the following format:
 - a. One digital and Three paper copies of product schedule or list unless otherwise indicated. Architect will return one two copies.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

- K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- U. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed

before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

- V. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- W. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit one digital three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

SECTION 013516 - ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes special procedures for alteration work.

1.3 DEFINITIONS

- A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.
- B. Consolidate: To strengthen loose or deteriorated materials in place.
- C. Design Reference Sample: A sample that represents the Architect's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.
- D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.
- F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.
- J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.
- K. Retain: To keep existing items that are not to be removed or dismantled.

- L. Strip: To remove existing finish down to base material unless otherwise indicated.

1.4 COORDINATION

- A. Alteration Work Sub-schedule: A construction schedule coordinating the sequencing and scheduling of alteration work for entire Project, including each activity to be performed, and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for alteration work.
 - 1. Schedule construction operations in sequence required to obtain best Work results.
 - 2. Coordinate sequence of alteration work activities to accommodate the following:
 - a. Owner's continuing occupancy of portions of existing building.
 - b. Owner's partial occupancy of completed Work.
 - c. Other known work in progress.
 - d. Tests and inspections.
 - 3. Detail sequence of alteration work, with start and end dates.
 - 4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
 - 5. Use of elevator and stairs.
 - 6. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use in existing structure. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.
- B. Pedestrian and Vehicular Circulation: Coordinate alteration work with circulation patterns within Project building(s) and site. Some work is near circulation patterns and adjacent to restricted areas. Circulation patterns cannot be closed off entirely and in places can be only temporarily redirected around small areas of work. Access to restricted areas may not be obstructed. Plan and execute the Work accordingly.

1.5 PROJECT MEETINGS FOR ALTERATION WORK

- A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site.
 - 1. Attendees: In addition to representatives of Owner, Architect, and Contractor, Owner's insurer if applicable, testing service representative, specialists, and chemical-cleaner manufacturer(s) shall be represented at the meeting.
 - 2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:
 - a. Alteration Work Subschedule: Discuss and finalize; verify availability of materials, specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Fire-prevention plan.
 - c. Governing regulations.

- d. Areas where existing construction is to remain and the required protection.
 - e. Hauling routes.
 - f. Sequence of alteration work operations.
 - g. Storage, protection, and accounting for salvaged and specially fabricated items.
 - h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
 - i. Qualifications of personnel assigned to alteration work and assigned duties.
 - j. Requirements for extent and quality of work, tolerances, and required clearances.
 - k. Embedded work such as flashings and lintels, special details, collection of waste, protection of occupants and the public, and condition of other construction that affects the Work or will affect the work.
 3. Reporting: Record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.
- B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at weekly intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
 1. Attendees: In addition to representatives of Owner, Architect, and Contractor, each specialist, supplier, installer, and other entity concerned with progress or involved in planning, coordination, or performance of alteration work activities shall be represented at these meetings. All participants at conference shall be familiar with Project and authorized to conclude matters relating to alteration work.
 2. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of alteration work. Include topics for discussion as appropriate to status of Project.
 - a. Alteration Work Subschedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.
 - b. Schedule Updating: Revise Contractor's Alteration Work Subschedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each entity present, including review items listed in the "Preliminary Conference for Alteration Work" Paragraph in this article and the following:
 - 1) Interface requirements of alteration work with other Project Work.
 - 2) Status of submittals for alteration work.
 - 3) Access to alteration work locations.
 - 4) Effectiveness of fire-prevention plan.
 - 5) Quality and work standards of alteration work.
 - 6) Change Orders for alteration work.
 3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.6 INFORMATIONAL SUBMITTALS

A. Alteration Work Subschedule:

1. Submit alteration work subschedule within 30 days of date established for commencement of alteration work.

B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.

C. Alteration Work Program: Submit 30 days before work begins.

D. Fire-Prevention Plan: Submit 30 days before work begins.

1.7 QUALITY ASSURANCE

A. Alteration Work Program: Prepare a written plan for alteration work for whole Project, including each phase or process and protection of surrounding materials during operations. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project alteration work program with specific requirements of programs required in other alteration work Sections.

1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.

B. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.

C. Safety and Health Standard: Comply with ANSI/ASSE A10.6.

1.8 STORAGE AND HANDLING OF SALVAGED MATERIALS

A. Salvaged Materials for Reinstallation:

1. Repair and clean items for reuse as indicated.
2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.

- B. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.
- C. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.
 - 1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
 - 2. Secure stored materials to protect from theft.
 - 3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F (3 deg C) or more above the dew point.

1.9 FIELD CONDITIONS

- A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of preconstruction photographs and preconstruction videotapes.
 - 1. Comply with requirements specified in Section 013233 "Photographic Documentation."
- B. Discrepancies: Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.
- C. Owner's Removals: Before beginning alteration work, verify in correspondence with Owner that the following items have been removed:
 - 1. Owner's equipment.
 - 2. Owner's furnishings.
 - 3. Other similar Owner's items.
- D. Size Limitations in Existing Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear permanent equipment, furnishings, other surfaces within existing spaces, areas, rooms, and openings, including temporary protection, by 12 inches (300 mm) or more.

PART 2 - EXECUTION

2.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.
 - 1. Use only proven protection methods, appropriate to each area and surface being protected.

2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
3. Erect temporary barriers to form and maintain fire-egress routes.
4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.

B. Temporary Protection of Materials to Remain:

1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.

C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

D. Utility and Communications Services:

1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.

1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

F. Existing Roofing: Prior to the start of work in an area, install roofing protection.

2.2 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated. Perform duties titled "Owner's Responsibility for Fire Protection."
 2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
 - a. If combustible material cannot be removed, provide fire blankets to cover such materials.
- B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:
1. Obtain Owner's approval for operations involving use of open-flame or welding or other high-heat equipment. Use of open-flame equipment is not permitted. Notify Owner at least 72 hours before each occurrence, indicating location of such work.
 2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
 3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
 4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
 5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
 6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
 - a. Train each fire watch in the proper operation of fire-control equipment and alarms.
 - b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
 - c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
 - d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
 - e. Maintain fire-watch personnel at each area of Project site until 60 minutes after conclusion of daily work.
- C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.
- D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.

1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.

2.3 PROTECTION DURING APPLICATION OF CHEMICALS

- A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.
- B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.
- C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.
- D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.
- E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

2.4 GENERAL ALTERATION WORK

- A. Have specialty work performed only by qualified specialists.
- B. Ensure that supervisory personnel are present when work begins and during its progress.
- C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs or video recordings. Comply with requirements in Section 013233 "Photographic Documentation."
- D. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.
- E. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

END OF SECTION 013516

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.
- C. Related Requirements:
 - 1. Section 012100 "Allowances" for testing and inspecting allowances.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
 2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of **five** previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

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

1.5 ACTION SUBMITTALS

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

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification: For Contractor's quality-control personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.

5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
 3. Owner-performed tests and inspections indicated in the Contract Documents.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee

payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.9 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of

manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
 4. Demonstrate the proposed range of aesthetic effects and workmanship.
 5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 7. Demolish and remove mockups when directed unless otherwise indicated.
- K. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

- a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.

3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections performed by the Owner: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

3.3 STATEMENT OF SPECIAL INSPECTIONS

- A. Special Inspections are in addition to other materials inspections included in the Specifications that are paid by the Owner.
- B. Schedule and coordinate Special Inspection Testing Agency or Special Inspectors access to the work.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
 - 1. AABC - Associated Air Balance Council; www.aabc.com.
 - 2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
 - 3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
 - 4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
 - 5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
 - 6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
 - 7. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org.
 - 8. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
 - 9. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
 - 10. AF&PA - American Forest & Paper Association; www.afandpa.org.
 - 11. AGA - American Gas Association; www.aga.org.
 - 12. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
 - 13. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
 - 14. AI - Asphalt Institute; www.asphaltinstitute.org.
 - 15. AIA - American Institute of Architects (The); www.aia.org.
 - 16. AISC - American Institute of Steel Construction; www.aisc.org.
 - 17. AISI - American Iron and Steel Institute; www.steel.org.
 - 18. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
 - 19. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
 - 20. ANSI - American National Standards Institute; www.ansi.org.
 - 21. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
 - 22. APA - APA - The Engineered Wood Association; www.apawood.org.
 - 23. APA - Architectural Precast Association; www.archprecast.org.
 - 24. API - American Petroleum Institute; www.api.org.
 - 25. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
 - 26. ARI - American Refrigeration Institute; (See AHRI).

27. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
28. ASCE - American Society of Civil Engineers; www.asce.org.
29. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
30. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
31. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
32. ASSE - American Society of Safety Engineers (The); www.asse.org.
33. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
34. ASTM - ASTM International; (American Society for Testing and Materials International); www.astm.org.
35. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
36. AWEA - American Wind Energy Association; www.awea.org.
37. AWI - Architectural Woodwork Institute; www.awinet.org.
38. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
39. AWWA - American Wood Protection Association; (Formerly: American Wood-Preservers' Association); www.awpa.com.
40. AWS - American Welding Society; www.aws.org.
41. AWWA - American Water Works Association; www.awwa.org.
42. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
43. BIA - Brick Industry Association (The); www.gobrick.com.
44. BICSI - BICSI, Inc.; www.bicsi.org.
45. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.com.
46. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
47. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bwfbadminton.org.
48. CDA - Copper Development Association; www.copper.org.
49. CEA - Canadian Electricity Association; www.electricity.ca.
50. CEA - Consumer Electronics Association; www.ce.org.
51. CFFA - Chemical Fabrics & Film Association, Inc.; www.chemicalfabricsandfilm.com.
52. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
53. CGA - Compressed Gas Association; www.cganet.com.
54. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
55. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
56. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
57. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
58. CPA - Composite Panel Association; www.pbmdf.com.
59. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
60. CRRC - Cool Roof Rating Council; www.coolroofs.org.
61. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
62. CSA - Canadian Standards Association; www.csa.ca.
63. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
64. CSI - Construction Specifications Institute (The); www.csinet.org.
65. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
66. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
67. CWC - Composite Wood Council; (See CPA).

68. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
69. DHI - Door and Hardware Institute; www.dhi.org.
70. ECA - Electronic Components Association; (See ECIA).
71. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
72. ECIA ? Electronic Components Industry Association; www.eciaonline.org
73. EIA - Electronic Industries Alliance; (See TIA).
74. EIMA - EIFS Industry Members Association; www.eima.com.
75. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
76. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
77. ESTA - Entertainment Services and Technology Association; (See PLASA).
78. EVO - Efficiency Valuation Organization; www.evo-world.org.
79. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
80. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
81. FM Approvals - FM Approvals LLC; www.fmglobal.com.
82. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
83. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarooft.com.
84. FSA - Fluid Sealing Association; www.fluidsealing.com.
85. FSC - Forest Stewardship Council U.S.; www.fscus.org.
86. GA - Gypsum Association; www.gypsum.org.
87. GANA - Glass Association of North America; www.glasswebsite.com.
88. GS - Green Seal; www.greenseal.org.
89. HI - Hydraulic Institute; www.pumps.org.
90. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
91. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
92. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
93. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
94. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
95. IAS - International Accreditation Service; www.iasonline.org.
96. IAS - International Approval Services; (See CSA).
97. ICBO - International Conference of Building Officials; (See ICC).
98. ICC - International Code Council; www.iccsafe.org.
99. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
100. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
101. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
102. IEC - International Electrotechnical Commission; www.iec.ch.
103. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
104. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
105. IESNA - Illuminating Engineering Society of North America; (See IES).
106. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
107. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
108. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
109. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
110. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.

111. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
112. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
113. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
114. ISO - International Organization for Standardization; www.iso.org.
115. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
116. ITU - International Telecommunication Union; www.itu.int/home.
117. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
118. LMA - Laminating Materials Association; (See CPA).
119. LPI - Lightning Protection Institute; www.lightning.org.
120. MBMA - Metal Building Manufacturers Association; www.mbma.com.
121. MCA - Metal Construction Association; www.metalconstruction.org.
122. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
123. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
124. MHIA - Material Handling Industry of America; www.mhia.org.
125. MIA - Marble Institute of America; www.marble-institute.com.
126. MMPA - Moulding & Millwork Producers Association; (Formerly: Wood Moulding & Millwork Producers Association); www.wmmpa.com.
127. MPI - Master Painters Institute; www.paintinfo.com.
128. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
129. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
130. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
131. NADCA - National Air Duct Cleaners Association; www.nadca.com.
132. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
133. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
134. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
135. NCMA - National Concrete Masonry Association; www.ncma.org.
136. NEBB - National Environmental Balancing Bureau; www.nebb.org.
137. NECA - National Electrical Contractors Association; www.necanet.org.
138. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
139. NEMA - National Electrical Manufacturers Association; www.nema.org.
140. NETA - InterNational Electrical Testing Association; www.netaworld.org.
141. NFHS - National Federation of State High School Associations; www.nfhs.org.
142. NFPA - NFPA; (National Fire Protection Association); www.nfpa.org.
143. NFPA - NFPA International; (See NFPA).
144. NFRC - National Fenestration Rating Council; www.nfrc.org.
145. NHLA - National Hardwood Lumber Association; www.nhla.com.
146. NLGA - National Lumber Grades Authority; www.nlga.org.
147. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
148. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
149. NRCA - National Roofing Contractors Association; www.nrca.net.
150. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
151. NSF - NSF International; (National Sanitation Foundation International); www.nsf.org.
152. NSPE - National Society of Professional Engineers; www.nspe.org.
153. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
154. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.

155. NWFA - National Wood Flooring Association; www.nwfa.org.
156. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
157. PDI - Plumbing & Drainage Institute; www.pdionline.org.
158. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
159. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
160. RFCI - Resilient Floor Covering Institute; www.rfci.com.
161. RIS - Redwood Inspection Service; www.redwoodinspection.com.
162. SAE - SAE International; (Society of Automotive Engineers); www.sae.org.
163. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
164. SDI - Steel Deck Institute; www.sdi.org.
165. SDI - Steel Door Institute; www.steeldoor.org.
166. SEFA - Scientific Equipment and Furniture Association; www.sefalabs.com.
167. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
168. SIA - Security Industry Association; www.siaonline.org.
169. SJI - Steel Joist Institute; www.steeljoist.org.
170. SMA - Screen Manufacturers Association; www.smainfo.org.
171. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
172. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
173. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
174. SPIB - Southern Pine Inspection Bureau; www.spib.org.
175. SPRI - Single Ply Roofing Industry; www.spri.org.
176. SRCC - Solar Rating and Certification Corporation; www.solar-rating.org.
177. SSINA - Specialty Steel Industry of North America; www.ssina.com.
178. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
179. STI - Steel Tank Institute; www.steeltank.com.
180. SWI - Steel Window Institute; www.steelwindows.com.
181. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
182. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
183. TCNA - Tile Council of North America, Inc.; (Formerly: Tile Council of America); www.tileusa.com.
184. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
185. TIA - Telecommunications Industry Association; (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
186. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
187. TMS - The Masonry Society; www.masonrysociety.org.
188. TPI - Truss Plate Institute; www.tpinst.org.
189. TPI - Turfgrass Producers International; www.turfgrasssod.org.
190. TRI - Tile Roofing Institute; (Formerly: National Tile Roofing Manufacturing Association); www.tilerroofing.org.
191. UBC - Uniform Building Code; (See ICC).
192. UL - Underwriters Laboratories Inc.; www.ul.com.
193. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
194. USAV - USA Volleyball; www.usavolleyball.org.
195. USGBC - U.S. Green Building Council; www.usgbc.org.
196. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.

197. WASTEC - Waste Equipment Technology Association; www.wastec.org.
198. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
199. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
200. WDMA - Window & Door Manufacturers Association; www.wdma.com.
201. WI - Woodwork Institute; (Formerly: WIC - Woodwork Institute of California); www.wicnet.org.
202. WMMPA - Wood Moulding & Millwork Producers Association; (See MMPA).
203. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
204. WPA - Western Wood Products Association; www.wppa.org.

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. DIN - Deutsches Institut f/r Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.
4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up-to-date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; www.usace.army.mil.
2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD - Department of Defense; <http://dodssp.daps.dla.mil>.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FAA - Federal Aviation Administration; www.faa.gov.
8. FG - Federal Government Publications; www.gpo.gov.
9. GSA - General Services Administration; www.gsa.gov.
10. HUD - Department of Housing and Urban Development; www.hud.gov.
11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; <http://eetd.lbl.gov>.
12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
13. SD - Department of State; www.state.gov.
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18. USP - U.S. Pharmacopeia; www.usp.org.
19. USPS - United States Postal Service; www.usps.com.

- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
 2. DOD - Department of Defense; Military Specifications and Standards; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
 3. DSCC - Defense Supply Center Columbus; (See FS).
 4. FED-STD - Federal Standard; (See FS).
 5. FS - Federal Specification; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
 6. MILSPEC - Military Specification and Standards; (See DOD).
 7. USAB - United States Access Board; www.access-board.gov.
 8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, temporary enclosures, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.
 - 2. Section 013516 "Alteration Project Procedures" for special procedures for alteration work.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
 - 1. Locations of dust-control partitions at each phase of work.
 - 2. HVAC system isolation schematic drawing.
 - 3. Location of proposed air-filtration system discharge.
 - 4. Waste handling procedures.
 - 5. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails] [, with galvanized barbed-wire top strand].
- B. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete or galvanized-steel bases for supporting posts.
- C. Wood Enclosure Fence: Plywood, [6 feet (1.8 m)] [8 feet (2.4 m)] high, framed with four 2-by-4-inch (50-by-100-mm) rails, with preservative-treated wood posts spaced not more than 8 feet (2.4 m) apart.
- D. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- E. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).
- F. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, Owner's Representative, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
 - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 - 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square tack and marker boards.
 - 3. Drinking water and private toilet.
 - 4. Coffee machine and supplies.
 - 5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).

6. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures".
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- G. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 2. Install lighting for Project identification sign.
- I. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
1. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.
 2. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.
- J. Electronic Communication Service: Provide a desktop or laptop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications. Equip computer with not less than the following:
1. Processor: Intel Pentium D or Intel CoreDuo, 3.0 GHz processing speed.
 2. Memory: 4 gigabyte.
 3. Disk Storage: 300 gigabyte hard-disk drive and combination DVD-RW/CD-RW drive.
 4. Display: 22-inch (560-mm) LCD monitor with 256-Mb dedicated video RAM.
 5. Full-size keyboard and mouse.
 6. Network Connectivity: 10/100BaseT Ethernet.
 7. Operating System: Microsoft Windows XP Professional or Microsoft Windows Vista Business.
 8. Productivity Software:
 - a. Microsoft Office Professional, XP or higher, including Word, Excel, and Outlook.
 - b. Adobe Reader 7.0 or higher.
 - c. WinZip 7.0 or higher.
 9. Printer: "All-in-one" unit equipped with printer server, combining color printing, photocopying, scanning, and faxing, or separate units for each of these three functions.
 10. Internet Service: Broadband modem, router and ISP, equipped with hardware firewall, providing minimum 384 Kbps upload and 1 Mbps download speeds at each computer.
 11. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing, and spam protection in a combined application.
 12. Backup: External hard drive, minimum 40 gigabyte, with automated backup software providing daily backups.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

D. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as indicated on Drawings.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
3. Maintain and touchup signs so they are legible at all times.

E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

F. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

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

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

- C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- D. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- E. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- G. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- H. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior and construction of other temporary walls and enclosures indicated on Drawings.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- I. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard, replace, or clean stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use permanent HVAC system to control humidity.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove materials that can not be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

- C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 - 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for requests for substitutions.
 - 2. Section 014200 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 PRIOR APPROVALS OF SUBSTITUTE MATERIALS

- A. Comparable Product Requests: All requests for substitute materials shall be made no later than 15 working days prior to the Bid Date. This allows a proper time for the Architect to review the materials. All requests shall be in the form of manufacturer's brochures in hard copy delivered to the Architect's office. No electronic submissions or faxes will be accepted. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Include all data to indicate compliance with the requirements specified in "Comparable Products" Article.
 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Additional information must still be submitted within 10 days of the bid date.
 3. If the substitute material is approved by the Architect, an addendum will be issued listing materials that are approved.
 - a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or prior approved material. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
 4. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

- b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
- 5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
 - 1. Evidence that the proposed product does not require revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 - 5. Samples, if requested.

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 013300 "Submittal Procedures" for submitting surveys.
 - 3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
 - 4. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.
 - 5. Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor engineers.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- C. Cutting and Patching Plan: Submit plan describing procedures at least **10** days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- E. Certified Surveys: Submit two copies signed by land surveyor.
- F. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in

increased maintenance or decreased operational life or safety. Operational elements include the following:

- a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Mechanical systems piping and ducts.
 - f. Control systems.
 - g. Communication systems.
 - h. Fire-detection and -alarm systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
 - k. Operating systems of special construction.
- C. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
1. Description of the Work.
 2. List of detrimental conditions, including substrates.
 3. List of unacceptable installation tolerances.
 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility or Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and site work.
- E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that

adequate provisions are made for locating and installing products to comply with indicated requirements.

- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- F. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- G. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.

- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 - 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 - 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous **demolition and construction** waste.
2. Recycling nonhazardous **demolition and construction** waste.
3. Disposing of nonhazardous **demolition and construction** waste.

1.2 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 ACTION SUBMITTALS

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

1.4 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis

- B. Waste Identification: Indicate anticipated types and quantities of **construction** waste generated by the Work. Include estimated quantities and assumptions for estimates.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 RECYCLING **CONSTRUCTION** WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Receivers and Processors: List below is provided for information only; available recycling receivers and processors include, but are not limited to, the following:
1. Contractor to provide name of companies involved.
- C. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall **accrue to Contractor**.
- D. Procedures in "Procedures" Paragraph below describe the "source-separated" method for handling recyclable waste. If space at Project site is limited, consider revising below to allow "co-mingled" method, which takes less space because it permits all recyclable waste to be placed in a single container that is separated later at the recycling facility.
- E. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

- a. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.3 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.4 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

- C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.
- D. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.
- E. Disposal: Remove waste materials from Owner's property and legally dispose of them.

3.5 SAMPLE FORMS

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 013233 "Photographic Documentation" for submitting final completion construction photographic documentation.
 - 2. Section 017300 "Execution" for progress cleaning of Project site.
 - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 5. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of **10** days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.

- a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.

5. Submit test/adjust/balance records.
6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

- C. Procedures Prior to Substantial Completion: Complete the following a minimum of **10** days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.

4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "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.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "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.

2. Should the Contractor not be ready by the third inspection, all other inspections shall be conducted and charged to the Contractor at the Architects and Engineers standard hourly rate. The Owner shall pay the consultants the total additional amount and the Contractor agrees to executing an negative Change Order to cover the additional cost to the Owner.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A.
 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
 4. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Architect will return annotated file.
 - b. Three paper copies. Architect will return two copies.

1.9 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 (215-by-280-mm) 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.

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. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural

weathering of exterior surfaces. Restore reflective surfaces to their original condition.

- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
- j. 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.
- k. Remove labels that are not permanent.
- l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- o. 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.
- p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
- q. Leave Project clean and ready for occupancy.

- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "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 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Product maintenance manuals.
- B. Related Requirements:
- C. Special Inspections are in addition to other materials inspections included in the Specifications.
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

- a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
2. Two paper copies for the Owner. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.
- C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least **15** days before commencing demonstration and training. Architect will return copy with comments.
 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within **15** days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
 1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.

- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- E. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one electronic and **one** set of marked-up record prints.
- B. Record Specifications: Submit one electronic and **one** paper copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one electronic and **one** paper copy of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of the manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one electronic and **one** paper copy of each submittal.

- E. Reports: Submit written report **weekly** indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
 1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets. When complete, copy the fully marked up set to a PDF file and forward to the Architect.
 2. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as paper copy and a scanned PDF electronic copy.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as paper copy and scanned PDF.
 - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as paper copy and scanned PDF.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.

1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
 - 1. At completion of training, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

- C. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
8. Repairs: Include the following:
 - a. Diagnosis instructions.

- b. Repair instructions.
- c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
- d. Instructions for identifying parts and components.
- e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
 - 3. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Architect, with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral performance-based test.

END OF SECTION 017900

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

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

1.2 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.3 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- B. Schedule of selective demolition activities with starting and ending dates for each activity.
- C. Predemolition photographs or video.

1.5 CLOSEOUT SUBMITTALS

- A. Inventory of items that have been removed and salvaged.

1.6 FIELD CONDITIONS

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

- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
- G. Maintain fire-protection facilities in service during selective demolition operations.
- H. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.7 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

- C. Inventory and record the condition of items to be removed and salvaged.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.3 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION

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

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 4. Maintain fire watch during and for at least 2 hours after flame-cutting operations.
 5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 6. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.
- 3.5 CLEANING
- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn demolished materials.

- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 042200 - CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Concrete masonry units.
2. Mortar and grout.
3. Steel reinforcing bars.
4. Masonry-joint reinforcement.
5. Embedded flashing.
6. Integral Water Repellant Admixture.
7. Masonry Ties and Anchors.
8. Miscellaneous masonry accessories.
9. Weep Vents.
10. Cavity Drainage Material.

- B. Related Requirements:

1. Section 051200 "Structural Steel Framing" for installing anchor sections of adjustable masonry anchors for connecting to structural steel frame.
2. Section 076200 "Sheet Metal Flashing and Trim" for sheet metal flashing and for furnishing.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

B. Shop Drawings: For the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Initial Selection:

1. Weep Vent.
2. Mortar Net.

D. Samples for Verification: For each type and color of the following:

1. Weep holes and cavity vents.
2. Accessories embedded in masonry.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Material Certificates: For each type and size of the following:

1. Masonry units.
 - a. Include data on material properties, material test reports substantiating compliance with requirements.
 - b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
2. Integral water repellant used in CMUs.
3. Cementitious materials. Include name of manufacturer, brand name, and type.
4. Mortar admixtures.
5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
6. Grout mixes. Include description of type and proportions of ingredients.
7. Reinforcing bars.
8. Joint reinforcement.
9. Anchors, ties, and metal accessories.

C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units,

mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.

- E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Build mockup of typical wall area as shown on Drawings.
 - 2. Build mockups for each type of exposed unit masonry construction in sizes approximately 60 inches (1500 mm) long by 60 inches (1500 mm) high by full thickness, including face and backup wythes and accessories.
 - a. Include a sealant-filled joint at least 16 inches (400 mm) long in each exterior wall mockup.
 - b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately 12 inches (300 mm) wide by 16 inches (400 mm) high.
 - 3. Protect accepted mockups from the elements with weather-resistant membrane.
 - 4. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
 - a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
 - b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 5. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls, and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
- C. Subject to compliance with requirements, provide products of one of the following manufacturers having similar products to the product specified:
 - 1. CMU:
 - a. State Block, Inc.
 - b. Acme Brick Co.
 - c. Pre-Approved Manufacturer.
- D. Substitutions: Manufacturers for substitution subject to the requirements of Section 01630, "Substitutions".

2.2 PERFORMANCE REQUIREMENTS

- A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.
 - 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.
 - 2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

2.3 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6 except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 feet (6 m) vertically and horizontally of a walking surface.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.4 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 2. Provide square-edged units for outside corners unless otherwise indicated.
- B. Integral Water Repellent: Provide units made with integral water repellent for exposed units.
 1. Integral Water Repellent: Silane-based, liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514/E 514M as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) ACM Chemistries.
 - 2) BASF Corporation; Construction Systems.
 - 3) Grace Construction Products; W.R. Grace & Co.
 - 4) Approved Equal.
 2. Basis of Design Product:
 - a. BASF Master Builders, Inc.; MasterPel 200HD.
- C. CMUs: ASTM C 90.
 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi (14.8 MPa).
 2. Density Classification: Normal weight unless otherwise indicated.
 3. Size (Width): Manufactured to dimensions 3/8 inch (10 mm) less-than-nominal dimensions.
 4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

2.5 MASONRY LINTELS

- A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.6 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction.
 - 1. Provide natural color, or white cement as required to produce mortar color indicated.
 - 2. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91/C 91M.
- E. Mortar Cement: ASTM C 1329/C 1329M.
 - 1. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
 - 2. Pigments shall not exceed 10 percent of portland cement by weight.
 - 3. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
- F. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979/C 979M. Use only pigments with a record of satisfactory performance in masonry mortar.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Davis Colors.
 - b. Lanxess Corporation.
 - c. Solomon Colors, Inc.
- G. Aggregate for Mortar: ASTM C 144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
 - 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 - 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- H. Aggregate for Grout: ASTM C 404.
- I. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
 - 1. Products: Subject to compliance with requirements, provide one of the following:

- a. Euclid Chemical Company (The); Accelguard 80.
 - b. Grace Construction Products, W. R. Grace & Co. - Conn.; Morset.
 - c. Sonneborn Products, BASF Aktiengesellschaft; Trimix-NCA.
- J. Water-Repellent Admixture: Silane-based liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ACM Chemistries.
 - b. BASF Corporation; Construction Systems.
 - c. Euclid Chemical Company (The); an RPM company.
 - d. Grace Construction Products; W.R. Grace & Co. -- Conn.
 - 2. Basis of Design Product:
 - a. BASF Master Builders, Inc.; MasterPel 200HD.
- K. Water: Potable.

2.7 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch (3.77-mm) steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
- C. Masonry-Joint Reinforcement, General: Ladder type complying with ASTM A 951/A 951M. Hohmann & Barnard No. 220 Ladder Mesh Reinforcement.
 - 1. Interior Walls: Type 304 Stainless Steel.
 - 2. Exterior Walls: Type 304 Stainless Steel.
 - 3. Wire Size for Side Rods: 0.187-inch (4.76-mm) diameter.
 - 4. Wire Size for Cross Rods: 0.187-inch (4.76-mm) diameter.
 - 5. Spacing of Cross Rods: Not more than 16 inches (407 mm) o.c.
 - 6. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.
- D. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder type with single pair of side rods.

2.8 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches (38 mm) into masonry but with at least a 5/8-inch (16-mm) cover on outside face.

- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
1. Mill-Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 641/A 641M, Class 1 coating.
 2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
 3. Stainless-Steel Wire: ASTM A 580/A 580M, Type 304.
 4. Galvanized-Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 (Z180) zinc coating.
 5. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
 6. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304.
 7. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 8. Stainless-Steel Bars: ASTM A 276 or ASTM A 666, Type 304.
- C. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of the wall.
1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 16 Gage thick steel sheet, Type 304 stainless steel. Hohmann & Barnard No. 315 Flexible Dovetail Tie.
 2. Tie Section: Triangular-shaped wire tie made from 0.25-inch- (6.35-mm-) diameter, Type 304 stainless steel wire. Mill-galvanized wire may be used at interior walls unless otherwise indicated. Hohmann & Barnard No. 315 Flexible Dovetail Brick Tie.
 - a. Dovetail Head Thickness: 12 Gage.
 - b. Tie Diameter: ¼" diameter.
- D. Rigid Anchors: Fabricate from steel bars 1-1/2 inches (38 mm) wide by 1/4 inch (6.35 mm) thick by 24 inches (610 mm) long, with ends turned up 2 inches (51 mm) or with cross pins unless otherwise indicated bent to configuration indicated. Hohmann & Barnard No. 344 Rigid Partition Anchor.
1. Type 304 Stainless Steel. Hohmann & Barnard No. 315 Flexible Dovetail Brick Tie.

2.9 MISCELLANEOUS ANCHORS

- A. Unit Type Inserts in Concrete: Cast-iron or malleable-iron wedge-type inserts.
- B. Anchor Bolts: Headed or L-shaped steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.
- C. Postinstalled Anchors: Torque-controlled expansion anchors or chemical anchors.

1. Load Capacity: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
2. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5 unless otherwise indicated.

2.10 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).
- D. Weep Vent Products:
 1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe, in color selected from manufacturer's standard.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Mortar Net Solutions; CellVent or compatible product by one of the following:
 - 1) Advanced Building Products Inc.
 - 2) Heckmann Building Products, Inc.
 - 3) Wire-Bond.
 - 4) Approved Equal.
 - b. Size: 4-inches high X 8-inches wide.
- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Mortar Net Solutions; Mortar Net with Insect Barrier or comparable product by one of the following:
 - a. Advanced Building Products Inc.
 - b. Heckmann Building Products, Inc.
 - c. Wire-Bond.
 - d. Approved Equal.

2. Configuration: Provide one of the following:
 - a. Strips, full depth of cavity and 10 inches (250 mm) high, with dovetail-shaped notches 7 inches (175 mm) deep that prevent clogging with mortar droppings.
 - b. Strips, not less than 1- inch (25 mm) thick and 10 inches (250 mm) high, designed to catch mortar droppings and prevent weep holes from clogging with mortar.

2.11 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, air-entraining agents, accelerators, retarders, antifreeze compounds, or other admixtures unless otherwise indicated.
 1. Do not use calcium chloride in mortar or grout.
 2. Use portland cement-lime, masonry cement or mortar cement mortar unless otherwise indicated.
 3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion or Property Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
 1. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
 2. Proportion grout in accordance with ASTM C 476, Table 1 or [paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).
 3. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
 2. Verify that foundations are within tolerances specified.
 3. Verify that reinforcing dowels are properly placed.
 4. Verify that substrates are free of substances that would impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Cast-In-Place Concrete must be fully cured prior to installation of concrete masonry units.

3.2 INSTALLATION, GENERAL

- A. Build chases and recesses to accommodate items specified in this and other Sections.
- B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.
- B. Lines and Levels:
1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
 3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.

5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm).

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm).

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches (100 mm). Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- G. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- H. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch (13-mm) clearance between end of anchor rod and end of tube. Space anchors 48 inches (1200 mm) o.c. unless otherwise indicated.
3. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078443 "Joint Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.

B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.

1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
2. Wet joint surfaces thoroughly before applying mortar.
3. Rake out mortar joints for pointing with sealant.

D. Rake out mortar joints at pre-faced CMUs to a uniform depth of 1/4 inch (6 mm) and point with epoxy mortar to comply with epoxy-mortar manufacturer's written instructions.

E. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

F. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

G. Cut joints flush where indicated to receive waterproofing unless otherwise indicated.

3.6 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
 - 1. Space reinforcement not more than 16 inches (406 mm) o.c.
 - 2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
 - 3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.
- E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.7 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
 - 1. Provide an open space not less than 1 inch (25 mm) wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

3.8 CONTROL AND EXPANSION JOINTS

- A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry using one of the following methods:
 - 1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
 - 2. Install preformed control-joint gaskets designed to fit standard sash block.
 - 3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.

4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.

3.9 LINTELS

- A. Provide masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.
- B. Provide minimum bearing of 8 inches (200 mm) at each jamb unless otherwise indicated.

3.10 WEEP AND CAVITY VENTS

- A. Installation, General: Install weep and cavity vents in accordance with manufacturer's written installation instructions.
- B. Weep Vents: Install weep vents a minimum of 32-inches on center.
- C. Cavity Vents: Position cavity vents to align with weep vents.

3.11 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 2. Limit height of vertical grout pours to not more than 60 inches (1520 mm).

3.12 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform

tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

- A. Inspections: Special inspections according to Level B or C in TMS 402/ACI 530/ASCE 5, and Level 1 or Level 2 special inspections according to the "International Building Code."
 - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 - 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- B. Testing Prior to Construction: One set of tests.
- C. Testing Frequency: One set of tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.
- D. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- E. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
- F. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.
- G. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.
- H. Prism Test: For each type of construction provided, according to ASTM C 1314 at 7 days and at 28 days.

3.13 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.14 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 1. Crush masonry waste to less than 4 inches (100 mm) in each dimension.
 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."
 3. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.
- C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042200

SECTION 042613 - MASONRY VENEER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Clay face brick.
 - 2. Mortar.
 - 3. Ties and anchors.
 - 4. Embedded flashing.
 - 5. Miscellaneous masonry accessories.

- B. Products Installed but not Furnished under This Section:

- 1. Steel lintels in masonry veneer.

- C. Related Requirements:

- 1. Section 051200 "Structural Steel Framing" for installing anchor sections of adjustable masonry anchors for connecting to structural steel frame.
 - 2. Section 076200 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Shop Drawings: For the following:

- 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 - 2. Stone Trim Units: Show sizes, profiles, and locations of each stone trim unit required.

3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Initial Selection:

1. Clay face brick.
2. Colored mortar.
3. Weep holes/vents.

1.6 INFORMATIONAL SUBMITTALS

- A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

1. Submittal is for information only. Receipt of list does not constitute approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.

- B. Material Certificates: For each type and size of the following:

1. Masonry units.
 - a. Include data on material properties.
 - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
 - c. For exposed brick, include test report for efflorescence according to ASTM C 67.
2. Cementitious materials. Include name of manufacturer, brand name, and type.
3. Mortar admixtures.
4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
5. Anchors, ties, and metal accessories.

- C. Mix Designs: For each type of mortar. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.

- D. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.7 QUALITY ASSURANCE

- A. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.

1. Where masonry is to match existing, build panels adjacent and parallel to existing surface.
2. Clean one-half of exposed faces of panels with masonry cleaner indicated.
3. Protect approved sample panels from the elements with weather-resistant membrane.
4. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
 - a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless such deviations are specifically approved by Architect in writing.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of veneer, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 1. Extend cover a minimum of 24 inches (600 mm) down face of veneer, and hold cover securely in place.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry. Immediately remove grout, mortar, and soil that come in contact with masonry.
 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 2. Protect sills, ledges, and projections from mortar droppings.

3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is **40 deg F (4 deg C)** and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects will be exposed in the completed Work.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

2.3 BRICK

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:

1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Clay Face Brick: Facing brick complying with ASTM C 216

1. Grade: SW.
2. Type: FBX.
3. Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested according to ASTM C 67.
4. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
5. Application: Use where brick is exposed unless otherwise indicated.
6. Where shown to "match existing," provide clay face brick matching color range, texture, and size of existing adjacent brickwork.
7. Color and Texture: As selected by Architect.

2.4 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Aggregate for Mortar: ASTM C 144.
1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- E. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.

- F. Water: Potable.
- G. Application: Unless otherwise indicated, use the following:
 - 1. Where flashing is indicated to receive counterflashing, use metal flashing.
 - 2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
 - 3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge.
 - 4. Where flashing is fully concealed, use metal flashing.
- H. Solder and Sealants for Sheet Metal Flashings: As specified in Section 076200 "Sheet Metal Flashing and Trim."
- I. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.
- J. Termination Bars for Flexible Flashing: Stainless steel steel bars 0.075 inch by 1 inch (1.9 mm by 25 mm).

2.5 MISCELLANEOUS MASONRY ACCESSORIES

- A. Weep/Vent Products: Use one of the following unless otherwise indicated:
 - 1. Round Plastic Weep/Vent Tubing: Medium-density polyethylene, 3/8-inch (9-mm) OD by 4 inches (100 mm) long.
 - 2. Rectangular Plastic Weep/Vent Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches (9 by 38 by 89 mm) long.
 - 3. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe, in color selected from manufacturer's standard.
 - 4. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe; in color selected from manufacturer's standard.
 - 5. Aluminum Weep Hole/Vent: Units made from sheet aluminum, designed to fit into a head joint and consisting of a vertical channel, with louvers stamped in web and with a top flap to keep mortar out of the head joint; factory primed and painted before installation to comply with Section 099113 "Exterior Painting" in color selected by Architect.
 - 6. Vinyl Weep Hole/Vent: Units made from flexible PVC, designed to fit into a head joint and consisting of a louvered vertical leg, flexible wings to seal against ends of masonry units, and a top flap to keep mortar out of the head joint; in color selected by Architect.

- B. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
 - 1. Configuration: Provide one of the following:
 - a. Strips, full depth of cavity and 10 inches (250 mm) high, with dovetail-shaped notches 7 inches (175 mm) deep that prevent clogging with mortar droppings.
 - b. Strips, not less than 3/4 inch (19 mm) thick and 10 inches (250 mm) high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.
 - c. Sheets or strips, full depth of cavity and installed to full height of cavity.
 - d. Sheets or strips not less than 3/4 inch (19 mm) thick and installed to full height of cavity with additional strips 4 inches (100 mm) high at weep holes and thick enough to fill entire depth of cavity and prevent weep holes from clogging with mortar.

2.6 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

2.7 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- C. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- D. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- E. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

- 1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
- 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
- 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

B. Lines and Levels:

- 1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
- 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
- 3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
- 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
- 5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
- 6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
- 7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus **1/8 inch (3 mm)**, with a maximum thickness limited to **1/2 inch (12 mm)**.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than **1/8 inch (3 mm)**.
3. For head and collar joints, do not vary from thickness indicated by more than plus **3/8 inch (9 mm)** or minus **1/4 inch (6 mm)**.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus **1/8 inch (3 mm)**.
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than **1/16 inch (1.5 mm)** from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond do not use units with less-than-nominal **4-inch (100-mm)** horizontal face dimensions at corners or jambs.
- C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
 1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
 2. Allow cleaned surfaces to dry before setting.
 3. Wet joint surfaces thoroughly before applying mortar.
 4. Rake out mortar joints for pointing with sealant.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.6 EXPANSION JOINTS

- A. General: Install expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form expansion joints as follows:
 - 1. Build flanges of metal expansion strips into masonry. Lap each joint **4 inches (100 mm)** in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
 - 2. Build flanges of factory-fabricated, expansion-joint units into masonry.
 - 3. Build in compressible joint fillers where indicated.
 - 4. Form open joint full depth of brick wythe and of width indicated, but not less than **[3/8 inch (10 mm)] [1/2 inch (13 mm)]** <Insert minimum width> for installation of sealant and backer rod specified in Section 079200 "Joint Sealants."

3.7 LINTELS

- A. Install steel lintels where indicated.
- B. Provide minimum bearing of **8 inches (200 mm)** at each jamb unless otherwise indicated.

3.8 FLASHING, WEEP HOLES, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
- B. as follows unless otherwise indicated:
 - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape.
 - 2. Extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least **8 inches (200 mm)**; Fasten upper edge of flexible flashing to sheathing through termination bar.
 - 3. At lintels and shelf angles, extend flashing a minimum of **6 inches (150 mm)** into masonry at each end. At heads and sills, extend flashing **6 inches (150 mm)** at ends and turn up not less than **2 inches (50 mm)** to form end dams.
 - 4. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than **1-1/2 inches (38 mm)** or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
 - 5. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing **1/2 inch (13 mm)** back from outside face of wall, and adhere flexible flashing to top of metal drip edge.

6. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing **1/2 inch (13 mm)** back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
 7. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.
- C. Install weep holes in veneers in head joints of first course of masonry immediately above embedded flashing.
1. Use specified weep/vent products to form weep holes.
 2. Space weep holes **24 inches (600 mm)** o.c. unless otherwise indicated.
 3. Space weep holes formed from plastic tubing **16 inches (400 mm)** o.c.
 4. Cover cavity side of weep holes with plastic insect screening at cavities insulated with loose-fill insulation.
 5. Trim wicking material flush with outside face of wall after mortar has set.
- D. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

3.9 FIELD QUALITY CONTROL

- A. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.
- B. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- C. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

3.10 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
7. Clean stone trim to comply with stone supplier's written instructions.
8. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.11 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 1. Crush masonry waste to less than 4 inches (100 mm) in each dimension.
 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."
 3. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.
- C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042613

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Structural steel.
 - 2. Grout.
- B. Related Requirements:
 - 1. Section 053100 "Steel Decking".

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication of structural-steel components.
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 2. Include anchor bolt and embedment drawings.
 - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts.
- C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer and fabricator.
- B. Welding certificates.
- C. Mill test reports for structural steel, including chemical and physical properties.
- D. Survey of existing conditions.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant.
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC 303.
 - 2. AISC 341.
 - 3. AISC 360.
 - 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes ASTM A 572/A 572M, Grade 50.
- B. Channel and, Angle Shapes: ASTM A 36/A 36M.

- C. Materials complying with first option in "Plate and Bar" Paragraph below are widely available; those complying with second option are less so. Third option is a specialty-steel material; verify availability if required.
- D. Plate and Bar: ASTM A 36..
- E. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, [Grade B] [Grade C], structural tubing.
- F. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.
- G. Steel Castings: ASTM A 216/A 216M, Grade WCB with supplementary requirement S11.
- H. Steel Forgings: ASTM A 668/A 668M.
- I. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.
- B. Headed Anchor Rods: ASTM F 1554, Grade 36.
- C. Threaded Rods: ASTM A 36.
 - 1. Nuts: ASTM A 563 heavy hex carbon steel.
 - 2. Washers: ASTM A 36 carbon steel.

2.3 PRIMER

- A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
- B. Galvanizing Repair Paint: In accordance with ASTM A 780.

2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

1. Camber structural-steel members where indicated.
 2. Fabricate beams with rolling camber up.
 3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
 4. Mark and match-mark materials for field assembly.
 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 1, "Solvent Cleaning."
- F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not enlarge by buring.
 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
1. Joint Type: Snug Tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of **2 inches**.

2. Surfaces to be field welded.
 3. Surfaces of high-strength bolted, slip-critical connections.
 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 5. Galvanized surfaces.
 6. Surfaces enclosed in interior construction.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
1. SSPC-SP 2, "Hand Tool Cleaning."
 2. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of **1.5 mils**. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.
- D. Painting: Prepare steel and apply a one-coat, nonasphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than **1.5 mils**.

2.8 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
 2. Galvanize **shelf angles** attached to structural-steel frame and located in exterior walls.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.2 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Baseplates Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of baseplate.
 - 3. Snug Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions.
- C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.3 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug Tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: The owner will engage a qualified testing agency to perform tests and inspections.
- B. Bolted Connections: Inspect bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.

3.5 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION 051200

SECTION 052100 - STEEL JOIST FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. K-series steel joists.
 - 2. KCS-type K-series steel joists.
 - 3. K-series steel joist substitutes.
 - 4. Joist accessories.
- B. Related Requirements:
 - 1. Section 051200 "Structural Steel Framing".

1.3 DEFINITIONS

- A. SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."
- B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support non-uniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of joist, accessory, and product.
- B. Shop Drawings:
 - 1. Include layout, designation, number, type, location, and spacing of joists.
 - 2. Include joining and anchorage details; bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.
 - 3. Indicate locations and details of bearing plates to be embedded in other construction.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data.
- B. Welding certificates.
- C. Manufacturer certificates.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's Specifications.
 - 1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
- B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle joists as recommended in SJI's Specifications.
- B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. VULCRAFT, NUCOR, NEW MILLENNIUM OR EQUAL.

2.2 K-SERIES STEEL JOISTS

- A. Manufacture steel joists of type indicated according to "Standard Specification for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
 - 1. Joist Type: See Plans.
- B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.
- C. Provide holes in chord members for connecting and securing other construction to joists.

- D. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."

2.3 PRIMERS

- A. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

2.4 JOIST ACCESSORIES

- A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's Specifications for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
- B. Furnish ceiling extensions if indicated, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within **1/2 inch (13 mm)** of finished wall surface unless otherwise indicated.
- C. High-Strength Bolts, Nuts, and Washers: ASTM F 3125/F 3125M, **Grade A325 (Grade A325M)**, Type 1, heavy-hex steel structural bolts; **ASTM A 563, Grade DH, (ASTM A 563M, Class 10S)** heavy-hex carbon-steel nuts; and ASTM F 436/F 436M, Type 1, hardened carbon-steel washers.
- D. Welding Electrodes: Comply with AWS standards.
- E. Galvanizing Repair Paint: **SSPC-Paint 20 ASTM A 780/A 780M.**
- F. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

2.5 CLEANING AND SHOP PAINTING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories.
- B. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than **1 mil (0.025 mm)** thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Do not install joists until supporting construction is in place and secured.
- B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications" and Joist Manufacturer's instructions.
 - 1. Before installation, splice joists delivered to Project site in more than one piece.
 - 2. Space, adjust, and align joists accurately in location before permanently fastening.
 - 3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
 - 4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads are applied.
- C. Field weld joists to supporting steel frame work. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Bolt joists to supporting steel framework as required for erection stability
- E. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Visually inspect field welds according to AWS D1.1/D1.1M.
- C. Visually inspect bolted connections.
- D. Prepare test and inspection reports.

3.4 PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.
- B. Touchup Painting: After installation, promptly clean, prepare, and prime or re-prime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories.
 - 1. Clean and prepare surfaces by hand-tool cleaning according to SSPC-SP 2 or power-tool cleaning according to SSPC-SP 3.
 - 2. Apply a compatible primer of same type as primer used on adjacent surfaces.

END OF SECTION 052100

SECTION 053100 - STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof deck.
- B. Related Requirements:
 - 1. Section 051200 "Structural Steel Framing"

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings:
 - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product Certificates: For each type of steel deck.
- C. Product Test Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
 - 1. Power-actuated mechanical fasteners.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
- C. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
 - 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

2.2 ROOF DECK

- A. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
 - 1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G90 zinc coating.

2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, **No. 10** minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of **33,000 psi**, not less than **0.0359-inch** design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of **33,000 psi**, of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 31 for overhang and slab depth.
- G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- H. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.
- I. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, .0598 inch thick minimum, with factory-punched hole of **3/8-inch** minimum diameter.
- J. Flat Sump Plates: Single-piece steel sheet, **0.0747 inch** thick, of same material and finish as deck. For drains, cut holes in the field.
- K. Recessed Sump Pans: Single-piece steel sheet, **0.0747 inch** thick, of same material and finish as deck, with **3-inch-** wide flanges and recessed pans of **1-1/2-inch** minimum depth. For drains, cut holes in the field.
- L. Galvanizing Repair Paint: ASTM A 780/A 780M SSPC-Paint 20, with dry film containing a minimum of 94 percent zinc dust by weight.
- M. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.

- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
 - 1. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF-DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members as indicated on the drawings.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports as indicated on the drawings
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 2 inches, with lapped end joints as follows:
- D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck.
- E. Install reinforcing channels or zees in ribs to span between supports and mechanically fasten.
- F. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Mechanically fasten to substrate to provide a complete deck installation.
 - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- G. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

3.4 FLOOR-DECK INSTALLATION

- A. Fasten floor-deck panels to steel supporting members as indicated on the drawings.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, as indicated on the drawings.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 2 inches, with lapped end joints.
- D. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.
- E. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: The owner will engage a qualified testing agency to perform tests and inspections.
- B. Field welds will be subject to inspection.
- C. Prepare test and inspection reports.

3.6 PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.
- B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on top surface of prime-painted deck immediately after installation, and apply repair paint.
 - 1. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.

END OF SECTION 053100

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior non-load-bearing wall framing.
 - 2. Soffit framing.
- B. Related Requirements:
 - 1. Section 051200 "Structural Steel Framing".

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of cold-formed steel framing product and accessory.
- B. Shop Drawings:
 - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
 - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
- C. Delegated-Design Submittal: For cold-formed steel framing.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Research Reports: For non-standard cold-formed steel framing, from ICC-ES.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

- B. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cold-formed steel framing. Submit stamped shop drawings and calculations for review prior to construction.

Shop drawings shall include, but not limited to:

- 1. Description of design criteria.
- 2. Selection of framing components and accessories.
- 3. Connections to structure and to adjacent components.
- 4. Plans and details depicting framing components, connection details, screw types, weld lengths, fastener requirements, etc.
- 5. Excel Engineering 920-926-9800 LIGHTGAUGE@EXCELENGINEERING.COM or equivalent firm.

- B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: As indicated.
 - 2. Deflection Limits: Design framing systems to withstand design without deflections greater than the following:
 - a. Exterior Non-Load-Bearing Framing: Horizontal deflection of $L/600$ of the wall height.
 - 3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of **120 deg F**.

4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 3/4".
 5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- C. Cold-Formed Steel Framing Design Standards:
1. Wall Studs: AISI S211.
 2. Headers: AISI S212.
 3. Lateral Design: AISI S213.
- D. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.

2.2 COLD-FORMED STEEL FRAMING, GENERAL

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
1. Grade: As required by structural performance.
 2. Coating: G60
- B. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade: As required by structural performance.
 2. Coating: G60

2.3 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.054 inch.
 2. Flange Width: 1 5/8" minimum.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: Match studs.
 2. Flange Width: 1 1/4 inch minimum.
- C. Vertical Deflection Clips: Manufacturer's standard clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.054 inch.
 - 2. Flange Width: 1 inch plus twice the design gap.
- E. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.4 SOFFIT FRAMING

- A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.043 inch.
 - 2. Flange Width: 1 5/8 inches minimum.

2.5 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.
 - 3. Web stiffeners.
 - 4. Anchor clips.
 - 5. End clips.
 - 6. Foundation clips.
 - 7. Gusset plates.
 - 8. Stud kickers and knee braces.
 - 9. Joist hangers and end closures.
 - 10. Hole reinforcing plates.
 - 11. Backer plates.

2.6 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

- B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hooked bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

2.7 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20.
- B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107/C 1107M, with fluid consistency and 30-minute working time.
- D. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.
- E. Sealer Gaskets: Closed-cell neoprene foam, 1/4inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.8 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.

3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by no fewer than three exposed screw threads.
4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of **1/8 inch in 10 feet** and as follows:
 1. Spacing: Space individual framing members no more than plus or minus **1/8 inch** from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of **1/8 inch**.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.
- C. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding **1/16 inch**.
- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- H. Install insulation, specified in Section 072100 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.
- J. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of **1/8 inch in 10 feet** and as follows:

1. Space individual framing members no more than plus or minus **1/8 inch** from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
 1. Stud Spacing: 16" OC max.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 1. Install single deep-leg deflection tracks and anchor to building structure.
 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 3. Connect vertical deflection clips to infill studs and anchor to building structure.
 4. Connect drift clips to cold-formed metal framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
 1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
 - a. Install solid blocking as required by design. 96" max.
 2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 3. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 4. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Miscellaneous Treated Wood Blocking.

1.3 REFERENCES

- 1. Underwriters Laboratories, Inc. (UL):
- 2. UL 580 Standard for Safety for Tests for Uplift Resistance of Roof Assemblies.

1.4 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 - 2. NHLA: National Hardwood Lumber Association.
 - 3. NLGA: National Lumber Grades Authority.
 - 4. SPIB: The Southern Pine Inspection Bureau.
 - 5. WCLIB: West Coast Lumber Inspection Bureau.
 - 6. WWPA: Western Wood Products Association.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:

1. Roof plan showing wood blocking, cants, fastening spacings.

1.6 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPAC U1; Use Category UC2.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat all miscellaneous carpentry unless otherwise indicated.
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing
 - 2. Plywood.

2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Rooftop equipment bases and support curbs.
- B. For concealed boards, provide lumber with 19 percent maximum moisture content and the following species and grades:
 - 1. Southern Yellow Pine; SPIB.

2.4 WOOD PANEL PRODUCTS

- A. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated.
- B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- C. Factory mark panels to indicate compliance with applicable standard.

2.5 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat all plywood unless otherwise indicated.

2.6 MISCELLANEOUS FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper, or as recommended by the pressure-preservative treatment manufacturer.
 - 2. The coating weights for zinc-coated fasteners shall be in accordance with hot-dip zinc coating complying with ASTM A 153/A 153M.
 - 3. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

- C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- D. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- E. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- F. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

PART 1 GENERAL

- C. The shop drawings shall be drawn up by the millwork company and not derived or copied from the Architect's electronic drawings.
- D. Indicate sizes, quantities, dimensions, hardware locations, methods of connecting, anchoring and fastening.
- E. Draw profiles, sections and views at a large enough scale to permit checking design conformity.
- F. The woodwork manufacturer is responsible for details and dimensions not controlled by job conditions and shall show on his shop drawings all required field measurements beyond his control. The general contractor and the woodwork manufacturer shall cooperate to establish and maintain these field dimensions.

1.05 COMPLIANCE

- A. All lumber shall meet or exceed grading rules and wood species of: AWP, APA, FS, ALSC, NFPA, CS, NEMA, SPIB, WWP, and AWP. All plywood shall bear an official grade.
- B. All bolts, nails, and screws shall meet or exceed Federal Specifications FF-B-100, -300, -500 and -800 Series.
- C. Moisture content of all lumber specified herein shall be kiln dried, KD, maximum of 15% moisture content, or S-Dry, 19% moisture content.
- D. Surfacing of all lumber specified shall be surfaced four sides, SDS, unless indicated otherwise.
- E. All plywood shall be stamped with APA grade trademarks.
- F. All lumber shall be free of knots and checks.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Casework Hardware: K & V, Stanley, Salice, Grass, Blum, or a prior approved substitute.
- B. Plastic Laminate: Nevamar, Formica, Wilson Art or a prior approved substitute.

2.02 MATERIALS

- A. Shelving: Economy grade, three quarter (3/4) inch fir plywood, A-B, Interior APA, edge banded, glued and nailed or as detailed. Finish by sanding, sealing, and two coats of polyurethane varnish. Sand between coats.
- B. Casework with High Pressure Laminate Finish shall be AWI Custom Grade. Details to conform to flush overlay design. Panels shall be 45-57 lb. density industrial particleboard, except as noted
 - 1. Exposed surfaces shall be high-pressure laminate.
 - a. Color as selected by the Architect.
 - 2. Counter tops of plastic laminate shall be as selected by the Architect
 - 3. Semi-exposed surfaces shall be faced with vertical grade laminate.

4. All drawers shall be dovetailed in front and back and securely glued to form a positive joint.
5. Base cabinets shall be fully wood framed at top and below top drawer opening.
6. Fasten all base cabinets per AWI recommendations.
7. Interior faces of cabinet walls, shelves, doors and drawers shall have vertical grade white melamine laminate on plywood or particleboard.
8. Base cabinets shall self-aligning positioning strips.
9. Exposed edges of sides, doors, open shelves and drawers shall be of matching plastic laminate.
10. Provide plastic or fabric silencers at all cabinet doors and drawers.
11. Provide 2" diameter drilled holes for wiring as indicated on drawings or as directed by the Architect, with plastic grommets as manufactured by Outwater Plastics Industries.

C. Casework hardware shall be furnished and installed by the casework manufacturer.

1. Cabinet hinges; Salice Series 200 – 170 degrees hinges, one pair for doors less than 36" tall; one and one-half pair for doors 36" to 60" in height; two pairs for doors 60" to 80" in height.
2. Drawer slides; Knap & Vogt 1305, rated at 100 lbs at 20" extension, nylon rollers with positive stop.
3. Catches; Stanley SP46.
4. Pulls; Stanley # 348315 – 4" satin chromium plated (26d)
5. Cabinet Locks: National, 1/2" chrome door/drawer utility lock; keyed to Owner's standards. All cabinet doors and drawers shall receive cabinet locks. Locks to be keyed alike for each classroom. Each classroom shall be keyed differently.

D. Closet and Shelving Hardware;

1. Shelf supports for casework; Knap & Vogt nos. 346 nickel-plated supports. Two shelf supports at each shelf end. Plastic supports shall not be used.
2. Adjustable Shelf Standards & Brackets; Knap & Vogt, #80 wall standard and #180 brackets, 16 ga cold rolled steel.
 - a. Standards; 5/8" wide x 13/32" wide with 1" slot adjustment.
 - b. Brackets; 2" height x depth for 12" shelving.
3. Utility Shelf Brackets; Stanley, 797, for 12" and 16" deep shelves, steel with baked on gray enamel finish. Provide screws as required.

E. Solid Surface Counter Tops:

1. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2. 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:
 - a. WilsonArt International; Div. of Premark International, Inc., 13MM (1/2"). Color as selected by the architect.
 - b. Dupont, Corian. Color as selected by the Architect.
2. Solid surfaced counter tops shall be in the following areas: all Toilet rooms and bathrooms and Lounge counter top.

F. Miscellaneous Wood Trim: "B" and better Fir or Poplar.

H. Fasteners: nails, FS FF-N-105; screws, FS FFS-111.

I. Glue and Contact Cement: Moisture resistant, CS35, Type II.

PART 3 EXECUTION

3.01 EXAMINING

A. Examine all floor and wall surfaces where casework is to be installed and determine that all is level and plumb. Floors shall not be out of level more than 1/8" in 5 feet.

B. Correct all conditions prior to installation of millwork so that no vertical edge of millwork has more than one-eighth inch (1/8") variance from wall to edge.

3.02 INSTALLING

A. Install all work level, true and plumb.

B. Sand all exposed surfaces of wood.

C. Fill all exposed fasteners to conceal them.

D. Provide matching scribe strips as necessary to finish to adjacent surfaces.

E. Cabinet doors shall be hung plumb and true. All hardware shall be installed in a manner that precludes any binding or improper functioning.

F. Coordinate all required cutouts for plumbing and electrical fixtures.

G. Verify all finish dimensions at site prior to submitting shop drawings or fabrication.

END

SECTION 070150.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Partial tear-off of roof areas indicated on Drawings.
 - 2. Re-cover preparation of entire roof area.
 - 3. Removal of flashings and counterflashings.
 - 4. Temporary roofing.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for use of premises and for phasing requirements.
 - 2. Section 015000 "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for reroofing preparation.

1.3 DEFINITIONS

- A. Partial Roof Tear-off: Removal of selected components and accessories from existing roofing system.
- B. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.
- C. Roof Re-Cover Preparation: Existing roofing system is to remain and be prepared for new roof installed over it.

1.4 PREINSTALLATION MEETINGS

- A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing tear-off, including, but not limited to, the following:

- a. Reroofing preparation, including roofing system manufacturer's written instructions.
- b. Temporary protection requirements for existing roofing system components that are to remain.
- c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
- d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
- e. Existing roof deck conditions requiring Architect notification.
- f. Existing roof deck removal procedures and Owner notifications.
- g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
- h. Structural loading limitations of roof deck during reroofing.
- i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
- j. HVAC shutdown and sealing of air intakes.
- k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
- l. Asbestos removal and discovery of asbestos-containing materials.
- m. Governing regulations and requirements for insurance and certificates if applicable.
- n. Existing conditions that may require Architect notification before proceeding.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Temporary Roofing Submittal: Product data and description of temporary roofing system.
 1. If temporary roof remains in place, include surface preparation requirements needed to receive permanent roof, and submit a letter from roofing manufacturer stating acceptance of the temporary roof and that its inclusion does not adversely affect the new roofing system's resistance to fire and wind or specified special warranty or its FM Approvals rating.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
 1. Include certificate that Installer is approved by warrantor of existing roofing system.
- B. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.
 1. Submit before Work begins.

- C. Landfill Records: Indicate receipt and acceptance of demolished roofing materials and hazardous wastes, such as asbestos-containing materials, by a landfill facility licensed to accept them.
- D. Regulatory Requirements:
 - 1. Comply with governing EPA notification regulations before beginning roofing removal.
 - 2. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.7 FIELD CONDITIONS

- A. Existing Roofing System: TPO and Standing Seam Metal Roofing.
- B. Owner will occupy portions of building immediately below reroofing area.
 - 1. Conduct reroofing so Owner's operations are not disrupted.
 - 2. Provide Owner with not less than 72 hours' written notice of activities that may affect Owner's operations.
 - 3. Coordinate work activities daily with Owner and place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
 - 4. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below affected area.
 - a. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.
- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
- F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
 - 1. Remove only as much roofing in one day as can be made watertight in the same day.
- G. Hazardous Materials: It is not expected that hazardous materials, such as asbestos-containing materials, will be encountered in the Work.
 - 1. Existing roof will be left no less watertight than before removal.
 - 2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.

PART 2 - PRODUCTS

2.1 TEMPORARY PROTECTION MATERIALS

- A. Plywood: DOC PS 1, Grade CD, Exposure 1.
- B. OSB: DOC PS 2, Exposure 1.

2.2 TEMPORARY ROOFING MATERIALS

- A. Design and selection of materials for temporary roofing are Contractor's responsibilities.
- B. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).
- C. Base Sheet: ASTM D 4601/D 4601M, Type II, nonperforated, asphalt-impregnated and -coated, glass-fiber sheet.
- D. Glass-Fiber Felts: ASTM D 2178/D 2178M, Type IV, asphalt-impregnated, glass-fiber felt.
- E. Asphalt Primer: ASTM D 41/D 41M.
- F. Roofing Asphalt: ASTM D 312/D 312M, Type III or IV.
- G. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FM Approvals' RoofNav.

2.3 INFILL AND REPLACEMENT MATERIALS

- A. Steel deck is specified in Section 053100 "Steel Decking."
- B. Fasteners: Factory-coated steel fasteners with metal or plastic plates listed in FM Approvals' RoofNav, and acceptable to new roofing system manufacturer.

2.4 AUXILIARY REROOFING MATERIALS

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protection of In-Place Conditions:

1. Limit traffic and material storage to areas of existing roofing that have been protected.
2. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.
- B. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.
- C. Shut off rooftop utilities and service piping before beginning the Work.
- D. Test existing roof drains to verify that they are not blocked or restricted.
 1. Immediately notify Architect of any blockages or restrictions.
- E. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.
 1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- F. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- G. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
 1. Prevent debris from entering or blocking roof drains and conductors.
 - a. Use roof-drain plugs specifically designed for this purpose.
 - b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.
 - a. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 ROOF TEAR-OFF

- A. Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.
- B. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.
- C. Partial Roof Tear-off: Remove existing roofing down to existing insulation and immediately check for presence of moisture.
 1. Remove wet or damp materials below existing roofing and above deck as directed by Architect.

2. Bitumen and felts that are firmly bonded to concrete decks are permitted to remain if felts are dry.
 - a. Remove unadhered bitumen, unadhered felts, and wet felts.

3.3 TEMPORARY ROOFING

- A. Install approved temporary roofing over area to be reroofed.
- B. Remove temporary roofing before installing new roofing.

3.4 BASE FLASHING REMOVAL

- A. Remove existing base flashings.
 1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.
- B. Inspect parapet sheathing, wood blocking, curbs, and nailers for deterioration and damage.
 1. If parapet sheathing, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.
- C. Remove existing parapet sheathing and replace with new parapet sheathing to comply with Section 061600 "Sheathing."
 1. If parapet framing, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.

3.5 DISPOSAL

- A. Collect demolished materials and place in containers.
 1. Promptly dispose of demolished materials.
 2. Do not allow demolished materials to accumulate on-site.
 3. Storage or sale of demolished items or materials on-site is not permitted.
- B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 070150.19

SECTION 072119

FOAM-IN-PLACE INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Medium-density, closed-cell polyurethane spray foam insulation with recycled content. (ICYNENE MD-C-200)

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.
- B. Section 07 91 26 - Joint Fillers.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM C 411 - Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
 - 2. ASTM C 518 - Test Method for Steady State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 3. ASTM C 1338 - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
 - 4. ASTM D 2842 - Test Method for Water Absorption of Rigid Cellular Plastics.
 - 5. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.
 - 6. ASTM E 90 - Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
 - 7. ASTM E 96 - Standard Test Method for Water Vapor Transmission of Materials.
 - 8. ASTM E 283 - Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - 9. ASTM E 2178 - Standard Test Method for Air Permeance of Building Materials.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Product test reports performed by a qualified independent testing agency evidencing compliance of insulation products with specified requirements including those for thermal resistance, fire-test-response characteristics, water-vapor transmission, water absorption, and other properties, based on comprehensive testing of current products.

4. Installation methods. Indicate special procedures, substrate and perimeter conditions requiring special treatment.
- C. Certifications:
1. Submit manufacturer's certificate that products meet or exceed specified requirements.
 2. Evaluation Report: Evidence of compliance of foam-plastic insulations with the International Building Code (IBC).
 3. Installer's certificate showing the Icynene installation certification.
 4. Submit installer qualifications.

1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide products from a single source from one manufacturer.
- B. Manufacturer Qualifications:
1. Product produced in an ISO 9001 registered factory.
 2. Company with minimum three years experience manufacturing specified products.
- C. Installer Qualifications:
1. Utilize an installer having demonstrated experience on projects of similar size and complexity.
 2. Utilize an Icynene Licensed Dealer (applicator) who has been trained and certified by Icynene.
- D. Coordinate mechanical ventilation and fresh air supply with Mechanical sections and ASHRAE Guidelines for optimum indoor air quality.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code requirements for flame and smoke ratings and non-combustibility as applicable.
- B. Fire-Test-Response Characteristics: Provide materials specified as determined by testing identical products per test method indicated below by a 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.
- C. Provide independent third party testing and labeling on product for fire hazard classification. Provide testing agency approval recognized by local Authority Having Jurisdiction (AHJ).

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Toxicity/Hazardous Materials:
1. Products containing urea-formaldehyde shall not be permitted.
 2. Products that contain no PBDEs.
 3. Products and equipment requiring or using CFCs, HCFCs, or HFCs during the manufacturing or application process will not be permitted
 4. Products that are "Low-emitting material".

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturers written instructions for storage, handling and protection prior to and during installation.
- B. Store both components in a temperature controlled area between 50 degree F (15 degree C) and 100 degree F (32 degree C). Do not allow product to freeze.
- C. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
- D. Use only those components that are supplied by the Manufacturer for the specified product.

1.9 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not expose to sunlight, except to extent necessary for period of installation and concealment.

1.10 WARRANTY

- A. Provide manufacturer's standard limited lifetime warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Icynene Corp., which is located at: 6747 Campobello Rd. ; Mississauga, ON; Canada L5N 2L7; Toll Free Tel: 800-758-7325; Tel: 905-363-4040; Fax: 905-363-0102; Email: [request info \(btroy@icynene.com\)](mailto:request info (btroy@icynene.com)); Web: www.icynene.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 MATERIALS

- A. Spray Insulation: ICYNENE MD-C-200 Polyurethane Spray Foam Insulation as manufactured by Icynene Inc.
 - 1. Description: Medium-density, closed-cell.
 - 2. Thermal Resistance (R-value per inch at 75 degrees F for 1 inch (25 mm) material): ASTM C518; 6.5 hr.sqft.degreeF/BTU.
 - 3. Thermal Resistance (R-value per inch for 3.5 to 11.25 inch (89 mm to 285 mm) thickness based on 4 inches aged 180 days at 70 degrees F): ASTM C518; 6.3 hr.sqft.degreeF/BTU.
 - 4. Air Permeance (for 1 inch (25 mm) of material): ASTM E 283; Less than 0.02 L/s.m2 at 75 Pa.
 - 5. Water Vapor Transmission (for 1.5 inches (38 mm) of material): ASTM E 96 Dessicant Method; 0.9 perms.
 - 6. Flame Spread and Smoke Developed Rating: ASTM E 84.
 - a. Flame Spread: Less than 25.
 - b. Smoke Development: Less than 450.
 - 7. Bacterial and Fungal Growth and Food Value: ASTM C 1338; not a source of food for mold (no growth).

8. Product Performance Evaluations:
 - a. ICC/ES Evaluation Report No. ESR 3199
 - b. Collaborative for High-Performance Schools (CHPS) "Low-emitting material" per CA 01350 Criteria.

PART 3 EXECUTION

3.1 PREPARATION

- A. Do not proceed with installation until substrates have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- B. Prepare substrates using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 1. Review placement area to determine final location will not be within 3 inches (76 mm) of any heat source where the temperature will exceed 200 degrees F (93 degrees C) per ASTM C 411 or in accordance with authorities having jurisdiction.
 2. Mask and protect adjacent surfaces from overspray or damage.
 3. Remove foreign materials, dirt, grease, oil, paint, laitance, efflorescence, and other substances that will affect application.
 4. Comply with manufacturer's written installation instructions for preparing cavities indicated to receive insulation to be free of any foreign material that will impede application.
 5. Verify that other work on and within spaces to be insulated is complete prior to application.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.2 APPLICATION

- A. Apply insulation in accordance with manufacturer's written application instructions. Apply insulation to a uniform thickness without voids.
- B. Apply to minimum cured thickness as indicated on the Drawings or as scheduled at the end of this Section.
- C. Apply insulation to fill voids around structural and equipment penetrations.

3.3 FIELD QUALITY CONTROL

- A. Inspect application for insulation thickness and density.

3.4 PROTECTION

- A. Do not permit subsequent work to disturb applied insulation.
- B. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.5 CONSTRUCTION WASTE MANAGEMENT

CONSTRUCTION DOCUMENT 100% SUBMITTAL
JEFFERSON PARISH SHERIFF'S OFFICE
WAREHOUSE TORNADO REPAIRS

JUNE 9, 2023
N-Y JOB NO.: 21023

- A. Plan and coordinate the insulation work to minimize the generation of offcuts and waste. Reuse insulation scraps to the maximum extent feasible.
- B. Separate and recycle waste materials in accordance with the Waste Management Plan and to the extent economically feasible.

END OF SECTION

SECTION 074113.16 - STANDING-SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes standing-seam metal roof panels.
- B. Related Sections:
 - 1. Section 074293 "Soffit Panels" for metal panels used in horizontal soffit applications.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at **Project site**.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of roof accessories and roof-mounted equipment.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
 - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 - 5. Review structural loading limitations of **deck** during and after roofing.
 - 6. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other construction that affect metal panels.
 - 7. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
 - 8. Review temporary protection requirements for metal panel systems during and after installation.
 - 9. Review procedures for repair of metal panels damaged after installation.
 - 10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Sustainable Design Submittals:

1. Product Test Reports: For roof materials, documentation indicating that roof materials comply with Solar Reflectance Index requirements.
2. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.

C. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than **3 inches per 12 inches (1:5)**.

D. Calculations:

1. Include calculations with registered engineer seal, verifying roof panel and attachment method resist wind pressures imposed on it pursuant to applicable building codes.

E. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

F. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Panels: **12 inches (305 mm)** long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Manufacturer and Installer.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in architectural sheet metal products.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical roof area and eave[, **including fascia,**] [**and soffit**] as shown on Drawings; approximately **48 inches (1200 mm)** square by full thickness, including attachments[, **underlayment,**] and accessories.
 - 2. Build mockups for typical roof area only, including accessories.
 - a. Size: **48 inches (1200 mm)** by **48 inches (1200 mm)**.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels until installation. Remove as panels are being installed. Verify film is not left on installed panels.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Galvalume Substrate Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, or perforating.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - 2. Warranty Period: 20 years and 6 months from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, chipping, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 40 years from date of Substantial Completion.
- C. Special Watertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain watertight, including leaks, within specified warranty period.
 - 1. Warranty Period: **20** years from date of Substantial Completion.
 - 2. Shop drawings must be provided to, reviewed, and approved by panel manufacturer prior to panel system installation.

3. Inspections by panel system manufacturer technical representative are required. Perform first inspection when underlayment and flashing are in place and second inspection when the roof is complete.
- D. Special Installer Warranty: Furnish a written warranty signed by the Panel Applicator guaranteeing materials and workmanship for watertightness of the roofing system, flashings, penetrations, and against all leaks.
 1. Warranty Period: 2 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 29 percent.
- B. Solar Reflectance Index (SRI): Three-year-aged SRI not less than **64** or initial SRI not less than **82** when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
- C. Energy Performance: Provide roof panels that are listed on the EPA/DOE's ENERGY STAR "Roof Product List" for **low**-slope roof products.
- D. Energy Performance: Provide roof panels according to one of the following when tested according to CRRC-1:
 1. Three-year, aged solar reflectance of not less than **0.55** and emissivity of not less than **0.75**.
 2. Three-year, aged Solar Reflectance Index of not less than **[64]** <Insert value> when calculated according to ASTM E 1980.
- E. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to **UL 580**:
 1. Wind Loads: As indicated on Drawings.
 2. Other Design Loads: **As indicated on Drawings**.
 3. Deflection Limits: For wind loads, no greater than **1/240** of the span.
- F. Air Infiltration: Air leakage of not more than **0.06 cfm/sq. ft. (0.3 L/s per sq. m)** when tested according to ASTM E 1680 and ASTM E 283 at the following test-pressure difference:
 1. Test-Pressure Difference: **6.24 lbf/sq. ft. (300 Pa)**.
- G. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 and ASTM E 331 at the following test-pressure difference:
 1. Test-Pressure Difference: **15 lbf/sq. ft. (718.2 Pa)**.

- H. Hydrostatic Head Resistance: No water penetration when tested according to ASTM E2140.
- I. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
 - 1. Uplift Rating: UL 90.
- J. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
 - 1. Fire/Windstorm Classification: Class 1A-**150**.
 - 2. Hail Resistance: SH.
- K. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): **120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.**

2.2 STANDING-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.
 - 1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.
 - 2. Aluminum Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1637.
- B. Vertical-Rib, Seamed-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and **panel striations** between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and mechanically seaming panels together.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Berridge Manufacturing Company; **Double-Lock Zee-Lock (180° Seam)** or comparable product by one of the following: No substitutions request will be accepted.
 - a. MBCI
 - b. Centria
 - c. Fabral

2. Metallic-Coated Steel Sheet: Aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, **Class AZ50** (**Class AZM150**) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Nominal Thickness: **0.024 inch** (**0.61 mm**)
 - b. Exterior Finish: **Two-coat fluoropolymer**.
 - c. Painted materials shall have a removable plastic film to protect the paint during roll forming, shipping and handling.
 - d. Color: **As selected by Architect from manufacturer's full range**.
3. Clips: **Continuous Zee-Rib** to accommodate thermal movement.
 - a. Material: **0.024-inch** (**0.61-mm**) nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.
 - b. Material: **0.064-inch** (**1.63-mm**) nominal thickness, zinc coated (galvanized) base with **0.033 inch** (**0.84 mm**) stainless-steel top.
4. Joint Type: **Double folded**.
5. Panel Coverage: **16 inches** (**406 mm**).
6. Panel Height: **2.0 inches** (**51 mm**).

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of **40 mils** (**1.02 mm**) thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.
 1. Thermal Stability: Stable after testing at **240 deg F** (**116 deg C**); ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus **20 deg F** (**29 deg C**); ASTM D 1970.
 3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Mid-States Asphalt Quick Stick HT Pro
 - b. Polyglass Polystick MTS
 - c. Tamko TW Underlayment or TW Metal & Tile Underlayment

2.4 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Sub framing and Furring: ASTM C 645; cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, **G90** (**Z275 hot-dip galvanized**) coating designation or ASTM A 792/A 792M, **Class AZ50** (**Class AZM150**) coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 - 1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
 - 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Gutters: Formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum **96-inch (2400-mm)** long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of **36 inches (914 mm)** o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match **metal roof panels**.
- E. Downspouts: Formed from same material as roof panels. Fabricate in **10-foot (3-m)** long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts to match gutters.
- F. Roof Curbs: Fabricated from same material as roof panels, **0.024 inch (0.61 mm)** nominal thickness; galvalume or stainless steel; supply an integral full-length cricket for curbs wider than **24 inches (610 mm)** supported by a structural metal deck. Fabricate curb flashing from **0.024 inch (0.61 mm)**. On open framing, provide roof underlayment and decking at and about roof curb per roofing manufacturer's requirements. Maintain a minimum of 1/2 of roofing panel width on each side of roof curb, and start panels a minimum of **9 inches (229 mm)** up slope of roof curb, flashing roofing panels to roof curb per roofing manufacturer's requirements. Fabricate curb and sub framing to withstand indicated loads of size and height of roof top equipment. Where required insulate roof curbs with rigid insulation.
- G. Panel Fasteners: Zinc-coated steel, corrosion resisting steel, zinc cast head, or nylon capped steel, type and size as approved for the applicable loading requirements.
- H. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are non-staining, and do not damage panel finish.
 - 1. Joint Sealant: Silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.

2.5 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements

demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using factory set, non-adjustable, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 - 3. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Steel Panels and Accessories:
 - 1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat applied by panel manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.75 ± 0.05 mil (0.0013 mm) over 0.2 ± 0.05 mil (0.0013 mm) primer coat, to provide a total dry film thickness of 0.95 ± 0.10 mil (0.024 mm). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of **0.35 mil** (0.009 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
 2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install sub framing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below and **on Drawings**, wrinkle free, in shingle fashion to shed water, and with end laps of not less than **6 inches** (152 mm) staggered **24 inches** (610 mm) between courses. Overlap side edges not less than **36 inches** (914.4 mm). Roll laps with roller. Cover underlayment within 14 days or as directed by the underlayment product manufacturer.
 1. Apply over the entire roof surface.
 2. At minimum apply over the roof area indicated below:

- a. Roof perimeter for a distance up from eaves of **24 inches (610 mm)** beyond interior wall line.
- b. Valleys, from lowest point to highest point, for a distance on each side of **18 inches (460 mm)**. Overlap ends of sheets not less than **6 inches (152 mm)**.
- c. Rake edges for a distance of **18 inches (460 mm)**.
- d. Hips and ridges for a distance on each side of **12 inches (305 mm)**.
- e. Roof-to-wall intersections for a distance from wall of **18 inches (460 mm)**.
- f. Around dormers, chimneys, skylights, and other penetrating elements for a distance from element of **18 inches (460 mm)**.

- B. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

3.4 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Shim or otherwise plumb substrates receiving metal panels to be level to **1/4 inch in 20 ft. (6 mm in 6.1 m)**.
 2. Flash and seal metal panels at perimeter of all openings. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 3. Locate and space fastenings in uniform vertical and horizontal alignment.
 4. Install flashing and trim as metal panel work proceeds.
 5. Panels should be continuous without end laps.
 6. Align bottoms of metal panels and fasten.
 7. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
 2. Aluminum Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use stainless-steel fasteners for surfaces exposed to the interior.
- C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- E. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.
1. Install clips to supports with self-tapping fasteners.

2. Install pressure plates, if required, at locations indicated in manufacturer's written installation instructions.
 3. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel are completely engaged.
- F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
- H. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than **36 inches (914 mm)** o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
- I. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely **1 inch (25 mm)** away from walls; locate fasteners at top and bottom and at approximately **60 inches (1524 mm)** o.c. in between.
1. Provide elbows at base of downspouts to direct water away from building.
 2. Connect downspouts to underground drainage system indicated.
- J. Roof Curbs: Install flashing around bases where they meet metal roof panels.
- K. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer.

3.5 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal panel units within installed tolerance of **1/4 inch in 20 feet (6 mm in 6 m)** on slope and location lines as indicated and within **1/8-inch (3-mm)** offset of adjoining faces and of alignment of matching profiles.

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.
- C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain a clean condition during construction.
- B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074113.16

SECTION 074213.13 - FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concealed-fastener, lap-seam metal wall panels.

B. Related Requirements:

1. Section 074293 "Soffit Panels" for metal panels used in horizontal soffit applications.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at **Project site**.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal panel assembly during and after installation.
8. Review of procedures for repair of metal panels damaged after installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
 - B. Sustainable Design Submittals:
 1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
 - C. Shop Drawings:
 1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than **3 inches per 12 inches (1:5)**.
 - D. Calculations:
 1. Include calculations with registered engineer seal, verifying wall panel and attachment method; resist wind pressures imposed on them pursuant to applicable building codes.
 - E. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.
 1. Include Samples of trim and accessories involving color selection.
 - F. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:
 1. Metal Panels: **12 inches (305 mm)** long by actual panel width. Include fasteners, closures, and other metal panel accessories.
- 1.4 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For manufacturer and Installer.
 - B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
 - C. Field quality-control reports.
 - D. Sample Warranties: For special warranties.
- 1.5 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
2. Installer: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly, including soffits, supports, attachments, and accessories.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Remove strippable protective covering on metal panels until installation. Remove as panels are installed. Verify that film is completely removed from installed panels.

1.8 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed in accordance with manufacturers' written instructions and warranty requirements.

1.9 COORDINATION

- A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

- A. Special Galvalume Substrate Warranty: Manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing or perforating.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - 2. Warranty Period: 20 years and six months from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, chipping, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 29 percent.
- B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing in accordance with ASTM E1592:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Deflection Limits: For wind loads, no greater than 1/240 of the span.

2.2 CONCEALED-FASTENER, LAP-SEAM METAL WALL PANELS

- A. Provide factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.
- B. Wide-Reveal-Joint, Concealed-Fastener Metal Wall Panels: Formed with vertical panel edges and a stepped profile between panel edges, resulting in a wide reveal joint between panels.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Berridge Manufacturing Co.; BR-12 for wall panels and Vented FW1025 for soffit panels or a prior approved comparable product.
 - 2. Metallic-Coated Steel Sheet: Aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, **Class AZ50** (**Class AZM150**) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
 - a. Nominal Thickness: **0.024 inch** (**0.61 mm**).
 - b. Surface: Smooth, flat finish.
 - c. Exterior Finish: Two-coat fluoropolymer.
 - d. Color: As selected by Architect from manufacturer's full range.
 - 3. Panel Coverage: **12 inches** (**305 mm**).
 - 4. Panel Height: **0.875 inch** (**22 mm**).

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of **40 mils** (**1.02 mm**) thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing at wall panels. Provide primer when recommended by underlayment manufacturer.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. GCP Applied Technologies Inc.; Grace Ultra.
 - b. Mid-States Asphalt; Quick Stick HT Pro.
 - c. Polyglass USA, Inc.; Polystick MTS.
 - d. SOPREMA; Lastobond Shield HT.
 - e. Tamko Building Products LLC; TW Underlayment or TW Metal & Tile Underlayment.
 - 2. Thermal Stability: Stable after testing at **240 deg F** (**116 deg C**); ASTM D1970.
 - 3. Low-Temperature Flexibility: Passes after testing at minus **20 deg F** (**29 deg C**); ASTM D1970.

2.4 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, **G90 (Z275)** hot-dip galvanized coating designation or ASTM A792/A792M, **Class AZ50 (Class AZM150)** aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 - 1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
 - 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 - 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch- (25-mm-)** thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Panel Fasteners: Zinc-coated steel, corrosion-resistant steel, zinc cast head, or nylon capped steel; type and size as approved for applicable loading requirements. Provide long-life exposed fasteners with heads matching color of metal panels by means of factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape **1/2 inch (13 mm)** wide and **1/8 inch (3 mm)** thick.
 - 2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.5 FABRICATION

- A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements

demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

- B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 - 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Steel Panels and Accessories:
 - 1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat applied by panel manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.75 mil (0.0191 mm), plus or minus 0.05 mil (0.0013 mm), over 0.2 mil (0.0051 mm) plus or minus 0.05-mil (0.0013-mm) primer coat, to provide a total dry film thickness of 0.95 mil (0.0241 mm), plus or minus 0.10 mil (0.024 mm). Prepare, pretreat, and apply coating to exposed metal

- surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.
2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.35 mil (0.009 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages in accordance with ASTM C754 and metal panel manufacturer's written instructions.

3.3 METAL PANEL INSTALLATION

- A. General: Install metal panels in accordance with manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 1. Shim or otherwise plumb substrates receiving metal panels to be level to 1/4 inch in 20 ft. (6 mm in 6.1 m).

2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended in writing by manufacturer.

1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide long-life metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
5. Flash and seal panels with weather closures at perimeter of all openings.

E. Watertight Installation:

1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels; and elsewhere as needed to make panels watertight.
2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
3. At panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.

F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
 1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 ft. (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.
- C. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.
- D. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- E. Prepare test and inspection reports.

3.5 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

CONSTRUCTION DOCUMENT 100% SUBMITTAL
JEFFERSON PARISH SHERIFF'S OFFICE
WAREHOUSE TORNADO REPAIRS

JUNE 9, 2023
N-Y JOB NO.: 21023

END OF SECTION 074213.13

SECTION 074800 - RAINSCREEN ATTACHMENT SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide a thermally broken, rainscreen attachment system for attachment of exterior cladding metal panel installed over continuous exterior-insulation.
- B. Related Sections:
 - 1. Section 054000 Cold-Formed Metal Framing for supplemental metal framing.
 - 2. Section 055000 Metal Fabrications for miscellaneous metal used as supplemental metal framing.
 - 3. Section 061600 Sheathing for gypsum sheathing for exterior walls.
 - 4. Section 074213.13 Formed Metal Wall Panels for cladding system.
 - 5. Section 072100 Thermal Insulation for exterior thermal continuous rigid board insulation, thermal batt insulation, and spray-foam insulation for penetration and gap sealing.

1.2 SYSTEM DESCRIPTION

- A. System assembly shall include the following components from the substrate out:
 - 1. Thermal Batt Insulation applied to interior wall cavity of light-gauge metal stud wall framing.
 - 2. Substrate: Structural Steel Wall framing assembly and exterior gypsum sheathing, or concrete masonry unit wall.
 - 3. Weather Resistant Air/Vapor Barrier over substrate.
 - 4. Continuous rigid insulation board.
 - 5. Thermally broken rainscreen attachment system.
 - 6. Exterior pre-finished formed metal cladding.
- B. Design Requirements:
 - 1. Manufacturer is responsible for designing system, including anchorage to structural system and necessary modifications to meet specified requirements and maintain visual design concepts.
 - 2. Employ registered professional engineer, licensed to practice engineering in jurisdiction where Project is located, to engineer each component of rainscreen attachment system.
 - 3. Structural Design: Exterior-insulated rainscreen wall assembly capable of withstanding effects of load and stresses from dead loads, wind loads, ice loads (if applicable) as indicated on Structural General Notes on Structural Drawings, and normal thermal movement without evidence of permanent defects of assemblies or components.

- a. Thermal Movements: Provide assemblies that allow for thermal movements resulting from the following maximum ambient temperatures by preventing overstressing of components and other detrimental effects:
 - 1) Temperature Change (range): 120 degrees Fahrenheit (67 degrees C), ambient:
- 4. Support Framing/Attachment System:
 - a. No framing component may penetrate the layer of continuous exterior insulation other than thermally isolated fasteners.
 - b. Frequency and spacing of stiffened horizontal girts as indicated by manufacture in project specific engineering package.
- C. Performance Requirements:
 - 1. Rainscreen Attachment System Performance: Comply with ANSI/ASHRAE 90.1-2010 definition of continuous insulation (c.i.).
 - 2. No thermal bridges other than fasteners and service openings.
 - 3. Thermal Performance:
 - a. Full constructed assembly must have a minimum 95% EFFECTIVE R-value when compared to the exterior continuous insulations rated R-Value.
 - b. Continuous framing profiles (including C- or Z-shaped sections or furring) penetrating insulation not allowed.
 - c. Perform effective R-Value calculation or modeling in accordance with ASHRAE guidelines.
 - d. Wall Assembly effective R-Value (U-Factor): R-VALUE (19.5)
 - 4. Structural Performance:
 - a. Wind Load Performance – Attachment system must show the following results when tested in accordance with ASTM E330-02.
 - 1) 90 pound per square foot negative and positive pressure held for 60 seconds, system components shall not experience failure or gross permanent distortion.
 - 2) 135 pound per square foot negative and positive pressure held for 10 seconds, system components shall not experience failure or gross permanent distortion.
 - b. Wind cycling (air pressure cycling) performance – Attachment system must show conformance to the following results when tested in accordance with ASTM E1886-05.
 - 1) A total of 4,500 air pressure cycles. Cycles must include 50 cycles at a maximum pressure of 90 pounds both positive and negative. Average cycle time must not be less than 3.25 seconds for both negative and positive cycles. Cladding weight supported during test must be a minimum of 11.5 pounds per square foot. No damage or deformation must be seen at end of test.

- c. Gravity load (dead load) performance – Attachment system must demonstrate resistance to deflection under shear loading, applied parallel to the wall assembly and directly to the attachment system. Testing must be conducted using calibrated equipment by an IAS accredited third party laboratory. Deflection not to exceed 0.050 inches at 150 pounds per square foot.
- 5. Framing Members:
 - a. Test framing components to AAMA TIR- A8-[04] – Section 7.2 to determine structural performance and effective moment of inertia for each perforated component. Minimum Effective Moment of Inertia: 0.0066 in^4 .
 - b. Localized bending stress for eccentrically loaded framing members must be evaluated with the maximum effective length of resisting element not more than 12 inches.
- 6. Fasteners:
 - a. Minimum Safety Factor of 3 for both tension and shear values
 - b. Combined tension and shear shall be evaluated according to an interaction formula. Sum of terms shall not exceed 1.0.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product literature and descriptions of testing performed on system components to indicate meeting or exceeding specified performance.
- B. Shop Drawings:
 - 1. Submit connection details to the cladding manufacturer, showing interface of rainscreen attachment system to substrate and panels with adjacent construction, signed and sealed by Professional Engineer.
 - 2. Show system installation and attachment, including fastener size and spacing.
- C. Structural Calculations:
 - 1. Submit rainscreen attachment manufacturer's comprehensive Structural Design analysis signed and sealed by a Professional Engineer.
- D. Samples: Submit following material samples for verification:
 - 1. Vertical Girts: Two (2) 12-inch long samples.
- E. Test Reports:
 - 1. Test to the following standards and provide written test reports by a third party:
 - a. AAMA TIR-A8-[04]: Structural Performance of Composite Thermal Barrier Framing Systems – Section 7.2
 - b. ASTM E330
 - c. ASTM E1233

- d. Gravity load test report, performed by IAS accredited third party
- 2. Comprehensive three-dimensional thermal modeling report indicating framing systems impact on exterior insulation rated R-value.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications:

- 1. Minimum 5 years' experience specializing in the manufacturing of façade attachment/support framing similar to those specified.
- 2. Ability to demonstrate conformance to testing requirements.

B. Installer Qualifications:

- 1. Minimum of 3 years' documented experience or minimum of 5 completed projects of equivalent scope and quality and recommended by manufacturer to perform work of this Section.
- 2. Onsite superintendent or foreman overseeing installation on site during entire work of this Section with experience equivalent to installer and in good standing with the manufacturer.

C. Engineer Qualifications: Registered professional engineer experienced in the design of curtain wall systems, anchors, fasteners and licensed to practice engineering in the jurisdiction where Project is located.

D. Pre-Installation Meeting:

- 1. Discuss sequence and scheduling of work and interface with other trades.
- 2. Review metal wall framing assemblies for potential interference and conflicts and coordinate layout and support provisions for interfacing work.
- 3. Review and document methods, procedures and manufacturer's installation guidelines and safety procedures for exterior wall assembly.

E. Mock-Ups: Coordinate mock-up materials and requirements with mock-up specified in Division 01 and exterior cladding specification.

1.5 QUALITY CONTROL

A. Single source responsibility:

- 1. Furnish engineered rainscreen attachment system components under direct responsibility of single manufacturer.

B. Field Measurements: Verify actual supporting and adjoining construction before fabrication.

- C. Record field measurements on project record shop drawings.
- D. Established Dimensions: Where field measurements cannot be made without delaying work, guarantee dimensions and proceed with fabrication of rainscreen attachment system corresponding to established dimensions.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver materials and components in manufacturers' original, unopened and undamaged containers or bundles, fully identified. Exercise care to avoid damage during unloading, storing and installation.
- B. Store, protect and handle materials and components in accordance with manufacturer recommendations to prevent damage, contamination and deterioration. Keep materials clean, dry, and free of dirt and other foreign matter, and protect from damage due to weather or construction activities.

1.7 SEQUENCING

- A. Ordering: Comply with manufacturers' ordering instructions and lead time requirements to avoid construction delays.
- B. Coordinate construction to ensure that assemblies fit properly to supporting and adjoining construction; coordinate schedule with construction in progress to avoid delaying work.

1.8 WARRANTY

- A. Manufacturer Warranties:
 - 1. Attachment System: Ten (10) year Limited Warranty.
 - a. Covers components of the attachment system, including structural failure of components when all the materials and components are supplied and installed per manufacturer's requirements.
 - b. Includes labor and material for removal and replacement of defective material.
 - c. Includes labor to remove and reinstall façade finish panels, finish closures and façade finish accessories necessary to access defective material.
- B. Contractor's Warranties: 2-year labor warranty, starting from date of Owner acceptance of completed work, to cover repair of materials found to be defective as a result of installation errors.
- C. Limitation of Warranties: Exclude repairs, replacement, and corrective work to the substrate, primary structure, finish panels, and/or property – unless otherwise noted above. Warranties exclude mechanical damage due to abuse, neglect, primary structure failure, or forces of nature greater than normal weather conditions.

1.9 MAINTENANCE

- A. Extra Materials: For use by Owner in building maintenance and repair, provide a recommended percentage of additional rainscreen attachment components in new, unopened cartons, packaged with protective covering for storage and identified with appropriate labels.

PART 2 - PRODUCTS

2.1 RAINSCREEN ATTACHMENT/SUPPORT FRAMING SYSTEM

- A. Comply with ANSI/ASHRAE 90.1-2010 definition of continuous insulation (c.i.).
- B. Coating Material: ASTM A1046, Zinc-Aluminum-Magnesium, minimum thickness ZM40.
 - 1. ASTM A653 Galvanized steel is not acceptable.
- C. Steel Classification: Structural Steel (SS), Grade 50, 50 ksi Yield.
- D. Spacing: Comply with manufacturer's Professional Engineers calculations.
- E. Primary Rail: Nominal 0.054-inch thick (16 gauge) cold-formed steel.
 - 1. Profile: Square hat channel with stiffening lips.
 - 2. Depth: 0.75 inches.
 - 3. Dimensions: 2.0 inches at web, 1.625 inches at each flange with 0.25 stiffening lips.
 - 4. Attachment Holes: Locate at 8 inch on center along back to facilitate number 14 self-drilling self-tapping screw with thermal isolation washer attachment to primary rail.
 - 5. Finish: Painted black at open joint panel assemblies.
 - 6. Basis of Design: RevealGirt™ by Knight Wall Systems.
 - 7. Or approved equal.
- F. Secondary Horizontal Rail: Nominal 0.046 inch thick (18 gauge) [0.054-inch thick (16 gauge)] cold-formed steel.
 - 1. Profile: Hat channel with stiffening lips.
 - 2. Profile Depth: 0.75 inches.
 - 3. Girt Fastening Face: 2.0 inches min, use Manufacturer's recommendation as Engineered.

4. Weep Drains: 0.75 inches diameter at 4 inches on center along flanges to allow for free air flow laterally.
5. Attachment Holes: Locate at 2 inch on center along back to facilitate number 14 self-drilling self-tapping screw attachment to primary rail.
 - a. Oversize holes to allow for thermal contraction and expansion of rail.
6. Finish: Painted black at open joint panel assemblies.
7. Basis of Design: PanelRail™ by Knight Wall Systems.
8. Or approved equal.

G. Fasteners:

1. Sufficient length to provide solid attachment through rigid insulation to structure as required by manufacturer.
2. Thermal Isolating Washers: Minimum 0.125 inch thick Polyoxymethylene copolymer (POM) washers with integral centering lip to act as a thermal break between wall anchor fasteners and girt.
 - a. Tensile Yield Strength: 9.57 ksi per ISO 527
 - b. Melting Temperature: 329 degrees Fahrenheit per ISO 3146
 - c. Basis of Design: ThermaStop™ Isolator by Knight Wall Systems.
 - d. Or approved equal.
3. Steel stud framing substrate: Self-drill hex-washer-head stainless steel with 1,000 hour salt-spray rated thermoset polyester coating.
 - a. Embedment depth: 0.625 inches or three full threads minimum, whichever is greater.
 - b. Minimum ultimate pull-out capacity from 18 gauge steel: 450 pounds.

H. Accessories:

1. Galvanic Protection: Utilize tapes and other methods as necessary to separate and prevent contact between dissimilar metals.

2.2 SIDING/CLADDING PANEL

- A. Refer to Division 07 Section 074213.13 Formed Metal Panels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with manufacturer requirements for installation conditions affecting performance of the work.
 - 1. Do not proceed with installation until unsatisfactory conditions have been corrected.
 - 2. Ensure weather-resistant barrier (WRB) and rigid insulation is installed prior to installing rainscreen attachment system.
 - 3. Ensure fenestration, transitions, discontinuities, sills, and ledgers are flashed and sealed to move moisture to the exterior of the building.
- B. Field verify architectural details and mechanical and electrical requirements prior to commencing installation.
- C. Commencement of installation constitutes acceptance of existing conditions and acceptance of responsibility for satisfactory performance.

3.2 RAINSCREEN ATTACHMENT SYSTEM INSTALLATION

- A. Preparation:
 - 1. Verify vertical girt spacing and framing clearances relative to studs or other points of attachment.
- B. Installation
 - 1. Install vertical girts in vertical orientation in strict accordance with manufacturer's installation instructions.
 - 2. Do not use shims to plumb the wall between the vertical girt and insulation.
 - 3. Minimum length of installed cut girt is 24-inches and shall be attached with at least two (2) fasteners.
 - 4. Mount box girts, fastened up to 32 inches on center (as determined by the manufacturer's engineering calculations), using one wall anchor per pre-punched attachment hole at spacing indicated on engineering calculations.
 - a. Check plumb of vertical girts both parallel and perpendicular to the structure.
 - b. Tighten screws that attach vertical girt through insulation to substructure to a snug tight condition and not stripped. Do not over-torque beyond manufacturer's recommendation. If installed using hand tools, verify for each installer at beginning of project using snug-tight criteria. Do not use stripped holes.
 - c. Where obstructions are present and unavoidable (i.e. window openings), use laser or chalk line to restart girt.
 - d. Locate vertical girt at jamb conditions and outside corner conditions.
 - e. Use shearing instruments (i.e. snips, nibbler, etc.) for cutting metal framing components. Saws are not recommended, as the sparks produced during cutting will damage the anti-corrosion coating. If sparks are generated during cutting, be sure the portion of the component to be installed on the building is protected from sparks and that any stockpile near the cutting station is also protected.
 - f. The systems components should not be cut while installed on the building, unless using a shearing instrument.

- g. Replace thermal isolator pieces that break during installation.
 - h. Provide a 3/8" – 1/2" gap between girts for expansion when multiple lengths of vertical girts are installed.
- 5. Attach secondary horizontal rails to vertical girts plumb, straight and square.
 - a. Tighten screws to a snug tight conditions and not stripped. Do not use stripped holes or screws.
 - b. Shims can be used between horizontal rail and vertical girt or cladding panel and horizontal rail (if approved by cladding manufacturer). Shims cannot be used between vertical girt and insulation.
 - c. Both flanges/edges of stiffened horizontal rail must be attached to vertical girt.

3.3 SIDING/CLADDING PANEL INSTALLATION – REFER TO SECTION 07410.

- A. The cavity must be clear and free from air flow and drainage obstructions.

END OF SECTION 074800

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Manufactured reglets with counterflashing.
 - 2. Formed roof-drainage sheet metal fabrications.
 - 3. Formed low-slope roof sheet metal fabrications.
 - 4. Formed equipment support flashing
- B. Related Requirements:
 - 1. Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
 - 3. Review requirements for insurance and certificates if applicable.
 - 4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
10. Include details of special conditions.
11. Include details of connections to adjoining work.
12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches (1:10).

C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

D. Samples for Verification: For each type of exposed finish.

1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Product Certificates: For each type of coping and roof edge flashing that is FM Approvals approved.

C. Product Test Reports: For each product, for tests performed by a qualified testing agency.

- D. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
 - 1. For copings and roof edge flashings that are FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - 1. Build mockup of typical roof edge, including built-in gutter fascia trim, approximately 10 feet (3.0 m) long, including supporting construction cleats, seams, attachments, underlayment, and accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

- a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. FM Approvals Listing: Manufacture and install roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-120. Identify materials with name of fabricator and design approved by FM Approvals.
- D. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
 1. Design Pressure: As indicated on Drawings.
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation or aluminum-zinc alloy-coated steel sheet according to ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation, Grade 40 (Grade 275); prepainted by coil-coating process to comply with ASTM A 755/A 755M.

1. Surface: Smooth, flat and with manufacturer's standard clear acrylic coating on both sides.
2. Color: As selected by Architect from manufacturer's full range.
3. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.
 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
- C. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- D. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

- E. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 2. Obtain field measurements for accurate fit before shop fabrication.
 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of **1/4 inch in 20 feet (6 mm in 6 m)** on slope and location lines indicated on Drawings and within **1/8-inch (3-mm)** offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
1. Form expansion joints of intermeshing hooked flanges, not less than **1 inch (25 mm)** deep, filled with butyl sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- E. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- G. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- H. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- I. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

- J. Do not use graphite pencils to mark metal surfaces.

2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum **96-inch-** (2400-mm-) long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
1. Gutter Profile: according to cited sheet metal standard.
 2. Expansion Joints: Butt type with cover plate .
 3. Gutters with Girth up to **15 Inches** (380 mm): Fabricate from the following materials:
 - a. Galvanized Steel: **0.022 inch** (0.56 mm) thick.
- B. Downspouts: Fabricate rectangular downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors.
1. Manufactured Hanger Style: Fig 1-34A according to SMACNA's "Architectural Sheet Metal Manual."
 2. Fabricate from the following materials:
 - a. Galvanized Steel: **0.022 inch** (0.56 mm) thick.

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing (Gravel Stop): Fabricate in minimum **96-inch-** (2400-mm-) long, but not exceeding **12-foot-** (3.6-m-) long sections. Furnish with **6-inch-** (150-mm-) wide, joint cover plates. Shop fabricate interior and exterior corners.
1. Joint Style: Butted with expansion space and **6-inch-** (150-mm-) wide, exposed cover plate.
 2. Fabricate from the Following Materials:
 - a. Galvanized Steel: **0.028 inch** (0.71 mm) thick.
- B. Base Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
1. Galvanized Steel: **0.028 inch** (0.71 mm) thick.
- C. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
1. Galvanized Steel: **0.022 inch** (0.56 mm) thick.
- D. Flashing Receivers: Fabricate from the following materials:
1. Galvanized Steel: **0.022 inch** (0.56 mm) thick.

- E. Roof-Penetration Flashing: Fabricate from the following materials:
 - 1. Galvanized Steel: 0.028 inch (0.71 mm) thick.

2.8 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing: Fabricate from the following materials:
 - 1. Galvanized Steel: 0.028 inch (0.71 mm) thick.

2.9 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

2.10 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.

2.11 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners[, solder], protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.

4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 5. Torch cutting of sheet metal flashing and trim is not permitted.
 6. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws .
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

2.12 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters: Join sections with joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.
1. Fasten gutter spacers to front and back of gutter.

2. Anchor and loosely lock back edge of gutter to continuous eave or apron flashing.
 3. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches (600 mm) apart.
 4. Anchor gutter with straps spaced not more than 24 inches (600 mm) apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
 5. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24 m) apart. Install expansion-joint caps.
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.
1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c.
 2. Provide elbows at base of downspout to direct water away from building.
- D. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches (100 mm) in direction of water flow.

2.13 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch (75-mm) centers.
- C. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of snap-in installation and sealant or lead wedges and sealant unless otherwise indicated.
- F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

2.14 MISCELLANEOUS FLASHING INSTALLATION

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

2.15 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of **1/4 inch in 20 feet (6 mm in 6 m)** on slope and location lines indicated on Drawings and within **1/8-inch (3-mm)** offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

2.16 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 078410 - THROUGH-PENETRATION FIRESTOP SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes through-penetration firestop systems for penetrations through fire-resistance-rated constructions and smoke partitions, including both empty openings and openings containing penetrating items.
- B. This Section includes firestop joint systems.
- C. Provide the following:
 - 1. 1 hour rated joint systems for all vertical and horizontal joints in shaft enclosures.
 - 2. 1 hr rated floor and wall penetration systems for all piping, ductwork conduit and cable trays penetrating vertical and horizontal surfaces in shaft enclosures.
 - 3. 1 hr rated floor and wall penetration systems for all piping, ductwork conduit and cable trays penetrating floors, walls, ceilings and fire blocking.

1.3 PERFORMANCE REQUIREMENTS

- A. General: For penetrations through the following fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
 - 1. Fire-resistance-rated walls including fire barriers and smoke partitions.
 - 2. Fire-resistance-rated horizontal assemblies including floors, floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies.
- B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814, UL 1479 or UL 2079:
 - 1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.
 - 2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:

- a. Penetrations located outside wall cavities.
 - b. Penetrations located outside fire-resistance-rated shaft enclosures.
- C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.
 - 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
 - 2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
 - 3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.
- D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.4 SUBMITTALS

- A. Product Data: Within 90 calendar days of the Contractor's Notice to Proceed, for each type of product indicated.
- B. Shop Drawings: For each through-penetration firestop system, show each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
 - 2. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
- C. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:
 - 1. Types of penetrating items.
 - 2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
 - 3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.
- D. Qualification Data: For Installer.

- E. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.
- F. Product Test Reports: From a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FMG according to FMG 4991, "Approval of Firestop Contractors."
- B. Installer Qualifications: A firm experienced in installing through-penetration firestop systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance.
- C. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
- D. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.
- E. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:
 - 1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is **UL**, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
 - 2. Through-penetration firestop systems are identical to those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems complying with the following requirements:
 - a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
 - b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:
 - 1) UL in its "Fire Resistance Directory."

- F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and

inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multi-component materials.

- B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.
- C. Notify Owner's inspecting agency at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.
- D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by Owner's inspecting agency and building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application that are produced by one of the following
 1. Grace, W. R. & Co. - Conn.
 2. Hilti, Inc.
 3. Johns Manville.
 4. Specified Technologies Inc.
 5. 3M; Fire Protection Products Division.
 6. Tremco; Sealant/Weatherproofing Division.
 7. USG Corporation.

2.2 FIRESTOPPING, GENERAL

- A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.
- B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:
 - 1. Permanent forming/damming/backing materials, including the following:
 - a. Slag-/rock-wool-fiber insulation.
 - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
 - c. Fire-rated form board.
 - d. Fillers for sealants.
 - 2. Temporary forming materials.
 - 3. Substrate primers.
 - 4. Collars.
 - 5. Steel sleeves.

2.3 FILL MATERIALS

- A. General: Provide through-penetration firestop systems containing the types of fill materials indicated in the Through-Penetration Firestop System Schedule at the end of Part 3 by referencing the types of materials described in this Article. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.
- B. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.
- C. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
- D. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.

- E. VOC Requirement: For sealants used as fill materials, provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No. 1168.

2.4 MIXING

- A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

- A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for firestop systems by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Include the following information on labels:
 - 1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Through-penetration firestop system designation of applicable testing and inspecting agency.
 - 4. Date of installation.
 - 5. Through-penetration firestop system manufacturer's name.
 - 6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified, independent inspecting agency to inspect through-penetration firestops. Independent inspecting agency shall comply with ASTM E 2174 requirements including those related to qualifications, conducting inspections, and preparing test reports.

- B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.
- C. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

3.6 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

END OF SECTION 07841

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Joint sealants not specified in other Sections.
- B. Related Sections:
 - 1. Section 092900 "Gypsum Board" for acoustical sealant in exterior wall assemblies.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample Warranties: For special warranties.

1.6 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
- B. Field-Adhesion-Test Reports: For each sealant application tested.
- C. Sample Warranties: For special warranties.

1.7 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANT MANUFACTURERS, GENERAL

- A. Approved Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. BASF Construction Chemicals – Building Systems.
2. Dow Corning Corp.
3. GE Construction Sealants.
4. Pecora Corporation.
5. Tremco Commercial Sealants & Waterproofing.
6. W.R. Meadows

- B. Basis of Design Products: For purposes of designating type and quality, drawings and specifications are based on Sealants provided by manufacturer indicated in Part 3 of these Specifications.

2.2 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:
1. Architectural sealants shall have a VOC content of 250 g/L or less.
 2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
 3. Sealants and sealant primers for nonporous substrates shall have a VOC content of 775 g/L or less.
- C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 SILICONE JOINT SEALANTS

- A. Single-Component, Nonsag, Non-Staining, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, Use NT; SWRI validated.
1. Basis of Design Product: Tremco, Inc., Spectrum 1.
 2. Volatile Organic Compound (VOC) Content: 1 g/L maximum.
 3. Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
 4. Staining, ASTM C 1248: None on concrete, marble, granite, limestone, and brick.
 5. Color: As selected by Architect from manufacturer's standard line of not less than 12 colors.

2.4 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

- a. Concrete.
 - b. Masonry.
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
 4. Provide flush joint profile at locations indicated on Drawings according to Figure 8B in ASTM C 1193.
 5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 10 tests for the first 1000 feet (300 m) of joint length for each kind of sealant and joint substrate.
 - b. Perform one test for each 1000 feet (300 m) of joint length thereafter or one test per each floor per elevation.
 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - b. Whether sealant dimensions and configurations comply with specified requirements.
 - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
 4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.

5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
 1. Joint Locations:
 - a. Perimeter joints between interior wall surfaces and frames of exterior side of windows and doors.
 - b. Other joints as indicated on Drawings.
 - c. Exterior Joints not included in other Sections of these Specifications.
 2. Joint Sealant: Silicone.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
 1. Joint Locations:
 - a. Perimeter joints between interior wall surfaces and frames of interior side of windows and doors.
 - b. Other joints as indicated on Drawings.
 - c. Interior Joints not included in other Sections of these Specifications.

2. Joint Sealant: Silicone.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes hollow-metal work.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. SDI A250.8 indicates that manufacturer's published details can replace Shop Drawings for hollow-metal work unless otherwise specified.
- C. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.
- D. Samples for Initial Selection: For units with factory-applied color finishes.
- E. Samples for Verification: For each type of exposed finish required.
- F. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
 - 1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities

having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

2.2 INTERIOR DOORS AND FRAMES

A. Standard-Duty Doors and Frames: SDI A250.8, Level 1. At locations indicated in the Door and Frame Schedule

1. Physical Performance: Level C according to SDI A250.4.
2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).
 - c. Face: Metallic-coated, cold-rolled steel sheet, minimum thickness of 0.032 inch (0.8 mm).
 - d. Edge Construction: Model 1, Full Flush.
 - e. Core: Manufacturer's standard.
3. Frames:
 - a. Materials: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
 - b. Construction: Knocked down.
4. Exposed Finish: Prime.

2.3 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2. At locations indicated in the Door and Frame Schedule.

1. Physical Performance: Level B according to SDI A250.4.
2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).
 - c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm), with minimum A40 (ZF120) coating.
 - d. Edge Construction: Model 1, Full Flush.
 - e. Core: Manufacturer's standard insulation material.
3. Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 6.0 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.
4. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
 - b. Construction: Knocked down.
5. Exposed Finish: Prime.

2.4 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.5 MATERIALS

- A. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- C. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- E. Power-Actuated Fasteners in Concrete: From corrosion-resistant materials.
- F. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).
- G. Glazing: Section 088000 "Glazing."

2.6 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 - 1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 3. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
 - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
 - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
 4. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
 - 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.
- D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.
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 each glazed lite is capable of being removed independently.
 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 4. Provide loose stops and moldings on inside of hollow-metal work.
 5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.7 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
1. Shop Primer: SDI A250.10.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-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 stops located on secure side of opening.
 - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - f. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 - 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
 - 4. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
 - 5. 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.
- B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).

- b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
 - c. At Bottom of Door: [3/4 inch (19.1 mm)] [5/8 inch (15.8 mm)] plus or minus 1/32 inch (0.8 mm).
 - d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
- 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- 3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
- C. Glazing: Comply with installation requirements in Section 088000 "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 (51 mm) o.c. from each corner.

3.2 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 Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 082100 WOOD DOORS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

- A. The provisions of all of the Contract Documents are hereby made a part of this Section.
- B. This section includes all flush wood doors with factory finished wood veneers, including machining, finishing and installing of wood doors.

1.02 STANDARDS

- A. Meet requirements and recommendations of applicable portions of the latest standards listed below:

- 1. National Woodwork Manufacturers Association NWMA
- 2. Underwriters' Laboratories UL
- 3. American Woodwork Institute AWI – Architectural Wood Door Quality Standards

1.03 SUBMITTALS

- A. Within 90 calendar days of the Contractor's Notice to Proceed, submit manufacturer' Product Data on materials specified.
- B. Coordinate all requirements and templates for hardware cut-outs.
- C. Submit shop drawings on all materials specified herein.
- D. Submit finished wood veneer samples for selection by architect.
- E. Submit a manufacturer's guarantee on materials and workmanship for a period of five years on all wood doors.

1.04 QUALITY ASSURANCE

- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.
- B. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated."
 - 1. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.

- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.06 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 43 and 70 percent during the remainder of the construction period.

1.07 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section, or show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors
 - 2. Warranty shall be in effect during the following period of time from date of Substantial Completion:
 - a. Solid-Core Interior Doors: Life of installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

Ipik, Oshkosh, Fenestra, Eggers Industries, Graham Wood Doors, Chappel, or a prior approved substitute.

2.02 DOOR CONSTRUCTION (non-fire rated)

A. Door stiles and rails must be bonded to the core before the assembly is planed to thickness.

1. Vertical Edges – laminated or of one piece hardwood 1 3/8" wide. No finger jointed material shall be used on exposed components.
2. Top rail minimum 2" thick; 5" thick where door closers are specified.
3. Bottom rail minimum of 2" thick.
4. Mid-rail of 10" solid wood required where panic hardware is specified.
3. Core shall be 28 - 32 pound density particleboard, glued AWI, PC5.
4. Adhesive shall be "Type I – waterproof"
5. Finish: AWI custom grade urethane varnish. Color to be selected by the Architect

2.03 INTERIOR DOOR FACES (other than special purpose doors)

A Wood Veneer Faces:

1. AWI Grade: Custom (Grade A faces).
2. Wood Veneer: Premium grade plain sliced white maple, book matched. Clear finish
Note: Veneer face must be 1/32" thick (minimum) before sanding . The architect must be notified on shop drawings of this exception.
3. Pairs, Sets, or Transom Matching: Doors and panels installed in the same opening are to be matched for grain and color.

2.04 LIGHTS, GRILLES AND LOUVERS

A. Provide openings for glass, grills or louvers as indicated on the door schedule. Glazing details to be metal framed as shown in manufacturer's standard details and coordinated. Properly reinforce all openings. Metal shall be factory primed and shall be painted on site per architect's selection.

2.05 PRE-FITTING AND PRE-MATCHING

- A. Prefit doors at factory with clearances: 1/8" on top, hinge and lock edged; 1/8" at meeting edges on paired doors; bevel both vertical edges 1/8" in 2".
- B. Machine doors for hardware as required by approved "Hardware Schedule".
1. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.

2. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
3. Light Openings: Trim openings with moldings of material and profile indicated.
4. Approved Hardware Schedule by the hardware supplier must be furnished complete with templates for all hardware requiring door preparation.
5. Approved door frame schedule must be provided and clearly note location and size of hardware preparation.
6. Each door shall be clearly marked with a tag and number on top of edge to identify location, swing and description of door.

2.06 FACTORY FINISHING WOOD VENEER

- A. Standard finish shall be AWI System TR-4 conversion varnish to be factory applied.
1. Architect shall select from manufacturer's standard stains.
 2. Filler: open grained.
 3. Sheen: medium rubbed.
 4. Lacquer finish will not be acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Prepare doors to receive finish hardware using templates provided by the hardware manufacturer.
- B. Install grilles if required by the mechanical documents.
- C. Bevel non fire rated door edges on lock side 1/8" in 2".
- D. Fit doors at job by planing sides, max. 3/16"; or sawing top and bottom (bottom only for fire rated doors), top 1/8" max., bottom 1/2" max. No splitting of veneer shall be allowed if sawn. Trimmed edges must be sealed or warranty shall be voided.

- E. Light and louver openings shall be factory cut prior to finishing not exceeding maximum sizes allowed by NFPA Life Safety Code, 1985.
- F. Install doors to swing freely and to stand, without holding, at any angle. Set hinges and strikes flush with surfaces of door and frame. Allow adequate clearances for joints, heads, thresholds, and floor material. Refer to mechanical documents for undercutting of doors for air return if required. Re-hang or replace doors that do not swing or operate freely.
- G. Protect finished doors at all times. Replace doors which, if damaged, cannot be touched up in a manner acceptable to the architect.

3.02 MAINTENANCE

- A. Clean completed systems after erection; protect same during construction.
- B. Maintain doors per manufacturer's instructions until turned over to user.

END

SECTION 08330
ROLLING SERVICE DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Rolling service doors.

1.2 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Support framing and framed opening.
- B. Section 08710 - Door Hardware: Product Requirements for cylinder core and keys.
- C. Section 09900 - Painting: Field applied finish.

1.3 REFERENCES

- A. ANSI/DASMA 108 - American National Standards Institute Standard Method For Testing Sectional Garage Doors And Rolling Doors: Determination Of Structural Performance Under Uniform Static Air Pressure Difference.
- B. NFRC 102 - Test Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.
- C. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.
- D. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- E. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- F. ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- G. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- H. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- I. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- J. NEMA MG 1 - Motors and Generators.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Single-Source Responsibility: Provide doors, tracks and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Details of construction and fabrication.
 - 4. Installation instructions.
- C. Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- B. Installer Qualifications: Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
- C. Store materials in a dry, warm, ventilated weathertight location.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 COORDINATION

- A. Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

1.10 WARRANTY

- A. Warranty: Manufacturer's limited door system warranty for 2 years for all parts and components.
- B. PowderGuard Finish
 - 1. PowderGuard Max: Applied to curtain, guides, bottom bar, headplates: Manufacturer's limited Max Finish warranty for 5 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Overhead Door Corporation, 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: info@overheaddoor.com.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 ROLLING SERVICE DOORS

- A. Light Commercial Doors: Overhead Door Corporation, Model 600 Coil-Away Rolling Service Doors.
 - 1. Curtain: Interlocking roll-formed galvanized steel slats, flat crown profile type CAW, 26 gauge for widths up to 12 feet 4 inches (3.75 m), 24 gauge for widths up to 16 feet (4.88 m). End of each slat shall be locked from lateral movement by a staking lock system. (Galvanized alternate malleable end locks.)
 - 2. Finish:
 - a. Curtain slats and hood shall be galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.
 - 1) Polyester Top Coat.
 - (a) Brown polyester.
 - 2) Powder Coat:
 - (a) PowderGuard Premium: Powder coat color as selected by the Architect.

- 3) Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
3. Weatherseals: Vinyl bottom seal.
4. Bottom Bar: Extruded aluminum.
5. Guides: Roll-formed galvanized steel shapes attached to continuous galvanized steel wall angle.
 - a. Finish: PowderGuard Premium powder coat, color as selected by Architect.
6. Brackets: Galvanized steel to support counterbalance and curtain.
 - a. Finish: PowderGuard Premium powder coat, color as selected by Architect.
7. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel and supporting the curtain with deflection limited to 0.03 inch per foot of span. Spring tension shall be adjustable.
8. Hood: Not Required.
9. Hood: 24 gauge galvanized steel with intermediate supports as required.
10. Manual Operation:
 - a. Manual push up for doors up to 100 SF.
 - b. Chain hoist for doors over 100 SF.
11. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
12. Locking:
 - a. Two interior bottom bar slide bolts for manually operated doors.
 - b. Exterior slide lock for manually operated mini-warehouse doors.
 - c. Chain keeper locks for chain hoist operation.
 - d. Interior slide bolt lock for electric operation.
 - e. Cylinder lock for electric operation.
13. Wall Mounting Condition: Face-of-wall.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Section 16150. Complete wiring from disconnect to unit components.
- F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.
- G. Install perimeter trim and closures.
- H. Instruct Owner's personnel in proper operating procedures and maintenance schedule.

3.4 ADJUSTING

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION

SECTION 087100 - FINISH HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Commercial door hardware for the following:
 - a. Swinging doors.
 - 2. Cylinders for doors specified in other Sections.
- B. Related Sections:
 - 1. Division 08 Section "Hollow Metal Frames" for astragals furnished as part of fire-rated labeled assemblies.
 - 2. Division 08 Section "Wood Doors" for astragals as part of fire-rated labeled assemblies.
 - 3. Division 08 Section "Aluminum-Framed Entrances and Storefronts" for entrance door hardware, except including cylinders.
 - 4. Division 08 Section "Automatic Entrances" for entrance door hardware
 - 5. Division 26 Sections for connections to electrical power system and for low-voltage wiring work.

1.3 SUBMITTALS

General: Within 90 calendar days of the Contractor's Notice to Proceed, submit the following in accordance with Conditions of Contract and Division 1 Specification sections.

- A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.

- a. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.
- D. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1. Upon completion of construction and building turnover, furnish two (2) complete maintenance manuals to the owner. Manuals to include the following items:
1. Approved hardware schedule, catalog cuts and keying schedule.
 2. Furnish keying bitting list in paper and electronic format by registered mail directly to facility manager owner.
 3. Hardware installation and adjustment instructions.
 4. Manufacturer's written warranty information.
- 1.4 QUALITY ASSURANCE
- A. Please be advised that Hardware Supplier and Hardware Installer must obtain a license with the Louisiana Office of State Fire Marshall in accordance to RS 40:1464 and RS 40:1664.
 - B. Door Hardware Installer Qualifications: An experienced and factory trained Installer who has completed both builders hardware installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
 - C. Door Hardware Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity which is not more than a half day of travel from the jobsite and who employs a qualified Architectural Hardware Consultant or equivalent experience available during the

course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying. Supplier recognized by manufacturers to be a direct factory-authorized distributor of the specified hardware products. Supplier is required to be available for onsite meetings with one days notice regarding issues that arise with opening functions, installation, keying, on-site warehousing, trouble shooting of products, and final punch out related issues.

1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- D. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant (AHC) and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
- E. Source Limitations: Obtain each type and variety of aluminum, steel and wood door hardware from the same single source manufacturer and supplier, unless otherwise indicated.
 1. Furnish exterior door hardware from the same manufactures as the interior door hardware, no deviations will be allowed.
- F. Regulatory Requirements: Comply with provisions of the following:
 1. Where indicated to comply with accessibility requirements, comply with "Americans with Disabilities Act" (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1, and "Texas Accessibility Standards" (TAS) as follows:
 - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
 - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
 2. NFPA 101: Comply with the following for means of egress doors:
 - a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. Thresholds: Not more than 1/2 inch high.
 3. International Building Code (2006).
- G. Fire-Rated Door Assemblies: Furnish door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
 1. Test Pressure: Positive pressure labeling.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. One complete shipment of door hardware as detailed in approved Door Hardware Schedule Shop Drawings to be inventoried on site and upon receipt of material is secure in lock-up room furnished with shelving for door hardware. Do not store electronic access control hardware, software or accessories at Project site without prior authorization and climate controlled facility, failure to do so will void electronic warranties.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver permanent keys and key records directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference". Hardware Supplier must be a regional supplier to address owner questions and concerns relating to keying issues that arise as project close-out.

1.6 COORDINATION

- A. Templates: Door Hardware Supplier to furnish and distribute to the parties involved for templating for doors, frames, and other work specified to be factory prepared for installing standard door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Keying Conference: Door Hardware Supplier to conduct keying conference to comply with requirements in Division 1 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Review all lock and exit device functions when reviewing keying requirements.
 - 4. Requirements for key control system.
 - 5. Installation of permanent keys and cylinder cores.
 - 6. Address the requirements for delivery of keys.
 - 7. Address keying and cylinder stamping (identification) as required by owner or owner representative.
 - 8. Establish method of submitting electronic format of keying systems and diagram and to be produced and furnished by Hardware Supplier.
- C. Pre-Installation Conference: Hardware Supplier to conduct conference at Project site attended by representatives of Door Hardware Manufacturers, Hardware Installers, Owner Representative and General Contractor to review proper hardware installation methods and the procedures for receiving and handling hardware. On site training should not be less than four hours of on-site training by qualified Hardware Supplier and Manufactures. At completion of installation and final walk through, furnish written certification that hardware items were applied according to conference recommendations and to finish hardware specifications.
- D. Existing Conditions: Door Hardware Supplier is responsible for coordination with existing conditions and hardware specified in Hardware Sets. The hardware specified in the Hardware Sets are to be considered the intent of applicable products for a complete opening solution as

required by the use and functions of the opening. The Hardware Sets specified are to be considered the base bid, upon review of existing conditions and where as items specified in the Hardware Sets will not comply with existing conditions, the supplier shall address the concerns and propose solutions to the contractor and architect in writing. Existing conditions field verification shall be done prior to submitting shop drawings with recommendations included in shop drawings. No deviations will be acceptable, supplier shall include the cost of trip charges to the site for verification. Any unforeseen conditions will be considered for proposal request.

1.7 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of standard hardware that fails in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Warranty Period: Two year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Five years for mortise locksets.
 - 2. Five years for exit devices.
 - 3. Ten years for manual door closers.
 - 4. Five years for Thresholds, Door Sweeps, Gasketing, Perimeter Weatherstripping.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Furnish door hardware for each door to comply with requirements in this Section and the Door Hardware Schedule at the end of Part 3.

1. Door Hardware Sets: Furnish quantity, item, size, finish or color indicated for named products listed in Hardware Sets.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule at the end of Part 3. Products are identified by using door hardware designations, as follows:
 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule. (Source manufacturer listed in boldface).

2.2 HINGES

- A. Manufacturers: Subject to compliance with requirements, furnish products by one of the following:
 1. Hinges:
 - a. Hager Companies (HA).
 - b. Ives (IVE)
 - c. McKinney Products (MC).
 - d. Stanley Hardware (ST).
 2. Continuous Geared Hinges (Aluminum):
 - a. Bommer Industries (BO).
 - b. Ives (IVE)
 - c. McKinney Products (MC).
 - d. Pemko Manufacturing (PE).
 - e. Select Hinges (SH).
- B. Standards: BHMA Certified products complying with the following:
 1. Butts and Hinges: BHMA A156.1.
 2. Continuous Geared Hinges: BHMA A156.26.
 3. Template Hinge Dimensions: BHMA A156.7.
- C. Quantity: Furnish the following, unless otherwise indicated:
 1. Two Hinges: For doors with heights up to 60 inches.
 2. Three Hinges: For doors with heights 61 to 90 inches.
 3. Four Hinges: For doors with heights 91 to 120 inches.
 4. For doors with heights more than 120 inches, furnish 4 hinges, plus 1 hinge for every 30 inches (of door height greater than 120 inches).
- D. Hinge Size: Furnish the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

Maximum Door Size (inches)	Hinge Height (inches)	Metal Thickness (inches)	
		Standard Weight	Heavy Weight

Maximum Door Size (inches)	Hinge Height (inches)	Metal Thickness (inches)	
		Standard Weight	Heavy Weight
36-in by 86-in by 1-3/4	4-1/2	0.134	0.180
>36-in by 120-in by 1-3/4	5	0.146	0.190

- E. Hinge Weight and Base Material: Unless otherwise indicated, furnish the following:
- Exterior Doors: Heavy weight, non-ferrous, ball bearing hinges.
 - Interior Doors: Heavy weight, ball bearing hinges unless Hardware Sets indicate standard weight.
 - Standard weight hinges can be used at Mechanical, Electrical, IDF, Data, and Offices with out closers openings, regardless of specified hinge weight in hardware sets.
- F. Hinge Height Clarifications: Where uneven door leafs occur, the widest door leaf in the pair determines the height and weight of the hinges on the inactive and active door leafs; to ensure equal size hinges on opening.
- G. Hinge Weight Clarification: If heavy weight hinges are specified in hardware sets for interior aluminum frames then standard weight hinges can be used. If aluminum frame opening has a door over 42 inches or greater then an additional hinge in lieu of heavy weight or 5 inch hinges.
- H. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:
- Non-removable Pins: Furnish set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
 - Out-swinging exterior doors.
 - Continuous-Geared Hinges (Aluminum): Minimum 0.120-inch thick, hinge leaves with minimum overall width of 4 inches; fabricated to full height of door and frame. Fabricate hinges non-handed and to template screw locations. Continuous hinges guaranteed for the life of the opening.

2.3 LOCKS AND LATCHES

- A. Manufacturers: Subject to compliance with requirements, furnish products by one of the following:
- Mechanical Mortise Locks and Latches:
 - Best (BES) - 4500 Series
 - Sargent Manufacturing (SA) - 8200 Series.
 - Schlage (SC) – L9000 Series
 - Auxiliary Mortise Deadbolts:
 - Adams Rite – MS1850S

- B. Standards: Comply with the following:
 - 1. Mortise Locks and Latches: BHMA A156.13.
 - 2. Auxiliary Locks: BHMA A156.5.
- C. Mortise Locks: BHMA Certified Grade 1, Series 1000.
- D. Auxiliary Locks: BHMA Certified Grade 1.
- E. Lock Trim: Match the following design style:
 - 1. Levers:
 - a. Best (BES) - 14R
 - b. Sargent Manufacturing (SA) – LNP
 - c. Schlage (SC) – 17A
- F. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following:
 - 1. Mortise Locks: BHMA A156.13.
- G. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
 - 1. Mortise Locks: Minimum 3/4-inch latchbolt throw, with stainless steel bolt.
 - 2. Deadbolts: Minimum 1-inch bolt throw.
- H. Backset: 2-3/4 inches unless otherwise indicated.

2.4 CYLINDERS AND KEYING

- A. Furnish cylinders keyed to a New System or Existing system as directed by owner..
- B. Manufacturers: Subject to compliance with requirements, furnish products by one of the following:
 - 1. Cylinders:
 - a. Best
 - b. Sargent
 - c. Schlage
- C. Standards: Comply with the following:
 - 1. Cylinders: BHMA A156.5.
 - 2. Key Control System: BHMA A156.5.
- D. Cylinder Grade: BHMA Certified Grade 1.

- E. Keying System: Unless otherwise indicated, furnish for a keying system complying with the following requirements:
 - 1. New Grand Master Key System: Cylinders are factory keyed operated by a change key, master key, and a grand master key. Conduct keying meeting with End User to define and document keying system instructions and requirements.
- F. Keys: Furnish nickel-silver keys complying with the following:
 - 1. Stamping: Permanently inscribe each key with a visual key control number and as directed by Owner.
 - 2. Quantity: Furnish the following:
 - a. Cylinder Change Keys (Per Key Set): Four.
 - b. Master Keys (Per Level): Five.
 - c. Grand Master Keys: Two.
 - d. Control Key - Five
 - e. Construction Master Keys – Five
 - f. Construction Control Key - Two
- G. Key Registration List: Furnish keying transcript list to Owner's representative for lock cylinders.
- H. Key Control System: Furnish one lockable cabinet for key control and storage for up to 150 percent capacity, type and model to be determined in the keying meeting with the owner. Furnish End User with one copy of "Key Wizard" key management software program

2.5 STRIKES

- A. Standards: Comply with the following:
 - 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 - 2. Strikes for Auxiliary Deadlocks: BHMA A156.5.
 - 3. Dustproof Strikes: BHMA A156.16.
- B. Strikes: Furnish manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 - 3. Aluminum-Frame Strike Box: Furnish manufacturer's special strike box fabricated for aluminum framing.

2.6 STOPS AND HOLDERS

- A. Manufacturers: Subject to compliance with requirements, furnish products by one of the following:

1. Stops and Holders:
 - a. Ives (IV).
 - b. Rockwood Manufacturing (RO).
 - c. Trimco Manufacturing (TR).
 - B. Standards: Comply with the following:
 1. Stops and Bumpers: BHMA A156.16.
 2. Combination Overhead Holders and Stops: BHMA A156.8.
 3. Door Silencers: BHMA A156.16.
 - C. Stops and Bumpers: BHMA Certified Grade 1.
 - D. Combination Overhead Stops and Holders: Certified BHMA Grade 1.
 1. Glynn-Johnson (GJ) – 450 Surface Series
 2. Rixson Hardware (RX) – 10 Surface Series.
 3. Sargent Hardware (SA) – 1700 Surface Series.
 - E. Provide Overhead stops where wall or floor stops are not applicable condition.
 - F. Floor Stops: For doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic.
 1. Where floor or wall stops are not appropriate, furnish overhead stops.
 - G. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch fabricated for drilled-in application to frame. Furnish (3) per single door and (2) per paired door frame if applied gasketing is not specified in Hardware Sets.
- 2.7 DOOR THRESHOLDS, WEATHERSTRIPPING AND GASKETING
- A. Manufacturers: Subject to compliance with requirements, furnish products by one of the following:
 1. Door Thresholds, Weatherstripping and Gasket Seals:
 - a. NGP Manufacturing (NG)
 - b. Pemko Manufacturing (PE).
 - c. Zero(ZER).
 - B. Standard: Comply with BHMA A156.22.
 - C. General: Furnish continuous weatherstrip seal on exterior doors and smoke, light, or sound gasketing on interior doors where specified. Furnish non-corrosive fasteners for exterior applications.
 1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame. Install header seal before mounting door closer arms.
 2. Meeting Stile Astragals: Fasten to meeting stiles, forming seal when doors are closed.

3. Door Sweep: Apply to bottom of door, forming seal with threshold when door is closed.
- D. Basic Sound Seal Requirement: Whether indicated on the drawings or not, furnish gasketing S88BL at sound rated wall types and at the following areas for limiting of sound transmission: private offices, exams, conference, private toilets, corridor openings, rooms and similar sound sensitive area.
- E. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 1. Furnish smoke labeled perimeter gasketing at all smoke labeled openings.
- F. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 1. Intumescent Seals and Gasketing: Furnish concealed, Category A type gasketing systems on assemblies where an intumescent seal is required to meet IBC and UL-10C positive pressure labeling.

2.8 FABRICATION

- A. Fasteners: Furnish door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Furnish screws according to manufacturers recognized installation standards for application intended.
 1. Furnish manufactures templated and approved stainless steel screws and fasteners for stainless steel hardware specified in the hardware sets.
- B. Mounting Accessories: Furnish drop plates, filler brackets, extended length screws, through bolts, and accessories for complete mounting with door, frame, light kits, applied molding and special applications as part of the base bid with complete installation per manufactures recommendations.

2.9 FINISHES

- A. Standard: Comply with BHMA A156.18.
- B. Furnish quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable and temporary protective covering before shipping to jobsite.
- D. BHMA Designations: Comply with base material and finish requirements indicated by the following:

1. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
2. BHMA 628: Satin aluminum, clear anodized, over aluminum base metal.
3. BHMA 630: Satin stainless steel, over stainless-steel base metal.
4. BHMA 652: Satin chromium plated over nickel, over steel base metal.
5. BHMA 689: Aluminum painted, over any base metal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Steel Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- C. Furnish and coordinate concealed wood blocking for wall mount stops as detailed in Door Hardware Schedule.

- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

3.4 FIELD QUALITY CONTROL

- A. The Contractor shall comply with AIA A201 1997 section 3.3.1 which reads as follows: "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, unless the contract Documents give other specific instructions concerning these matters."
- B. Field Inspection: Supplier and Door Hardware Manufacturer will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.
- B. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:
 - 1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
 - 2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
 - 3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper finish. Furnish final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

3.8 DOOR HARDWARE SETS

- A. The hardware sets listed below represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections.

Heading: 01

Each Opening To Have:

3	HINGE	5BB1	652	IVE
1	OFFICE LOCK	L9050T X 17A	626	SCH
1	CYLINDER CORE	23-030 X GMK	626	SCH
1	FLOOR STOP	FS439	626	IVE
3	SILENCER	DOOR SILENCERS BY FRAME MFG		

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
 - 1. Glazing for interior and exterior doors.
 - 2. Patterned Glass for Receptionist's Windows.
 - 3. Glazing sealants and accessories.
- B. Related Requirements:
 - 1. Section 081113 "Hollow Metal Doors and Frames for Hollow Metal Doors.

1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.

1. Tinted glass.
 2. Coated glass.
 3. Laminated glass.
 4. Insulating glass.
- C. Glazing Accessory Samples: For sealants and colored spacers, in 12-inch (300-mm) lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For glass.
- C. Product Test Reports: For tinted glass, coated glass, insulating glass and glazing sealants, for tests performed by a qualified testing agency.
1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- D. Preconstruction adhesion and compatibility test report.
- E. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
- E. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Install glazing in mockups specified in Section 084113 "Aluminum-Framed Entrances and Storefronts" Section 085113.02 "Aluminum-Clad Wood Windows" to match glazing systems required for Project, including glazing methods.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
 1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
 2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
 3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
 4. Schedule enough time for testing and analyzing results to prevent delaying the Work.
 5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F (4.4 deg C).

1.11 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass

is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

- B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 5 years from date of Substantial Completion.

- C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.
1. Obtain tinted glass from single source from single manufacturer.
 2. Obtain reflective-coated glass from single source from single manufacturer.
- B. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.

- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.
 - 1. Design Wind Pressures: As indicated on Drawings.
 - 2. Design Wind Pressures: Determine design wind pressures applicable to Project according to ASCE/SEI 7, based on heights above grade indicated on Drawings.
 - a. Wind Design Data: As indicated on Drawings.
 - 3. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.
 - 4. Probability of Breakage for Sloped Glazing: For glass surfaces sloped more than 15 degrees from vertical, design glass for a probability of breakage not greater than 0.001.
 - 5. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less.
 - 6. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- D. Windborne-Debris-Impact Resistance: Exterior glazing shall comply with enhanced-protection testing requirements in ASTM E 1996, as modified herein, for Wind Zone 3 when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on Project and shall be installed in same manner as glazing indicated for use on Project.
 - 1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade, Enhanced Protection.
- E. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- F. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 - 1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
 - 2. For laminated-glass lites, properties are based on products of construction indicated.
 - 3. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
 - 4. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
 - 5. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 - 6. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
 2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
 3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
 4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
1. Minimum Glass Thickness for Exterior Lites: 6 mm.
 2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.
- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Ultraclear Float Glass: ASTM C 1036, Type I, Class I (clear), Quality-Q3; and with visible light transmission of not less than 91 percent and solar heat gain coefficient of not less than 0.37.
- C. Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.
- D. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- E. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- F. Pyrolytic-Coated, Low-Maintenance Glass: Clear float glass with a coating on first surface having both photocatalytic and hydrophilic properties that act to loosen dirt and to cause water to sheet evenly over the glass instead of beading.
- G. Ceramic-Coated Vision Glass: ASTM C 1048, Condition C, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3; and complying with Specification No. 95-1-31 in GANA's "Engineering Standards Manual."

2.5 LAMINATED GLASS

- A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 1. Construction: Laminate glass with polyvinyl butyral interlayer, Ionomeric polymer interlayer, or cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written instructions.
 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 3. Interlayer Color: Clear unless otherwise indicated.
- B. Windborne-Debris-Impact-Resistant Laminated Glass: Comply with requirements specified above for laminated glass except laminate glass with one of the following to comply with interlayer manufacturer's written instructions:
 1. Polyvinyl butyral interlayer.
 2. Polyvinyl butyral interlayers reinforced with polyethylene terephthalate film.
 3. Ionomeric polymer interlayer.
 4. Cast-in-place and cured-transparent-resin interlayer.
 5. Cast-in-place and cured-transparent-resin interlayer reinforced with polyethylene terephthalate film.

2.6 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
 1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
 2. Spacer: Aluminum with bronze, color anodic finish.
 3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.7 GLAZING SEALANTS

- A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 3. Field-applied sealants shall have a VOC content of not more than 250 g/L.
 4. Sealants shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 5. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

2.8 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
1. AAMA 804.3 tape, where indicated.
 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.10 WET GLAZING SEALANT

- A. Medium-Modulus Neutral-Curing Silicone Glazing Sealant: Where glazing sealants of this designation are indicated or required for Additional Movement Capability, provide products complying with the following:
 - 1. Products: Available products include the following
 - a. 756 H.P.; Dow Corning.
 - b. Silglaze II; GE Silicones.
 - c. 895; Pecora Corporation.
 - 2. Type and Grade: S (single component) and NS (nonsag).
 - 3. Class: 25.
 - 4. Additional Movement Capability: 50 percent movement in extension and 50 percent movement in compression for a total of 100 percent movement. Use Related to Exposure: NT (nontraffic).
 - 5. Uses Related to Glazing Substrates: M, G, A, and, as applicable to glazing substrates indicated, O.
 - a. Use O Glazing Substrates: Coated glass, color anodic aluminum, galvanized steel.

2.11 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
 - 1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
 - a. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

- C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep systems.
 - 3. Minimum required face and edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

- F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. General: Use only Sealants as recommended by the Glazing Manufacturer and the Glazing Gasket Manufacturer for the materials provided.
- B. Verify Compatibility of Sealant with the Glazing and Glazing Gasket Manufacturer.
- C. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- D. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- E. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at

frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 INSULATING-LAMINATED-GLASS SCHEDULE

A. Glass Type GL-1: Patterned Glass.: Fully tempered float glass.

1. Basis-of-Design Product: 1/16" Binswanger Cross Reeded.
2. Tint Color: Clear.
3. Minimum Thickness: 4 mm.
4. Safety glazing required.

B. Glass Type GL-2: Low-E-coated, tinted, insulating laminated glass, spandrel glass.

1. Basis-of-Design Product: Viracon Stormguard.
2. Overall Unit Thickness: 1-inch (24 mm).
3. Minimum Thickness of Outdoor Lite: 6 mm.
4. Outdoor Lite: Tinted fully tempered float glass.
5. Tint Color: Gray.
6. Interspace Content: Argon.
7. Indoor Lite: Clear laminated glass with two plies of fully tempered float glass.
 - a. Minimum Thickness of Each Glass Ply: 0.24-inch (6 mm).
 - b. Interlayer Thickness: 0.090 inch (2.29 mm).
 - c. Spandrel Glass: Warm grey frit on #4 surface.
8. Low-E Coating: Sputter-coated on second surface.
9. Winter Nighttime U-Factor: .25 maximum.
10. Summer Daytime U-Factor: .22 maximum.
11. Visible Light Transmittance: 30 percent minimum.
12. Solar Heat Gain Coefficient: .23 maximum.
13. Safety glazing required.

END OF SECTION 088000

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Non-load-bearing steel framing systems for interior gypsum board assemblies.
 - 2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.

- B. Related Requirements:

- 1. Section 054000 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs; floor joists; roof rafters and ceiling joists; and roof trusses.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For dimpled steel studs and runners, firestop tracks, from ICC-ES.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 - 2. Protective Coating: ASTM A 653/A 653M, G60 (Z180, hot-dip galvanized unless otherwise indicated.
- B. Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners.
 - 1. Steel Studs and Runners:
 - a. Minimum Base-Metal Thickness: As indicated on Drawings or if not indicated, minimum 0.018 inch (0.45 mm), or as required for height of wall and the stud properties from the manufacture's sizing charts.
 - b. Depth: As indicated on Drawings, or if not indicated, minimum 3-5/8 inches (92 mm), or as required for height of wall and the stud properties from the manufacture's sizing charts.
 - 2. Dimpled Steel Studs and Runners:
 - a. Minimum Base-Metal Thickness: Minimum 0.015 inch (0.38 mm) or as required for height of wall and the stud properties from the manufacture's sizing charts.
 - b. Depth: As indicated on Drawings, or if not indicated, minimum 3-5/8 inches (92 mm) or as required for height of wall and the stud properties from the manufacture's sizing charts.
- C. Slip-Type Head Joints: Where indicated, provide one of the following:
 - 1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.
 - 2. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- D. 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.
- E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Metal Thickness: Minimum 0.018 inch (0.45 mm).
- F. Cold-Rolled Channel Bridging: Steel, 0.053-inch (1.34-mm) minimum base-metal thickness, with minimum 1/2-inch- (13-mm-) wide flanges.

1. Depth: Minimum 1-1/2 inches (38 mm).
2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.068-inch- (1.72-mm-) thick, galvanized steel.

G. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base-Metal Thickness: Minimum 0.018 inch (0.45 mm).
2. Depth: 7/8 inch (22.2 mm).

H. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.

1. Configuration: Asymmetrical or hat shaped as indicated on Drawings.

I. Cold-Rolled Furring Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.

1. Depth: Minimum 3/4 inch (19 mm).
2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch (0.8 mm).
3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.

J. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 7/8 inch (22 mm), minimum uncoated-metal thickness of 0.018 inch (0.45 mm), and depth required to fit insulation thickness indicated.

2.3 SUSPENSION SYSTEMS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.

B. Hanger Attachments to Concrete:

1. Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E 488 by an independent testing agency.
 - a. Type: Postinstalled, chemical anchor or Postinstalled, expansion anchor.
2. Powder-Actuated Fasteners: Suitable for application indicated, fabricated from corrosion-resistant materials with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E 1190 by an independent testing agency.

- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch (4.12 mm) in diameter.
- D. Flat Hangers: Steel sheet, 1 by 3/16 inch (25 by 5 mm) by length indicated or as required.
- E. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch (1.34 mm) and minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: Minimum 1-1/2 inches (38 mm) or as required for the installation.
- F. Furring Channels (Furring Members):
 - 1. Cold-Rolled Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges, 3/4 inch (19 mm) deep.
 - 2. Steel Studs and Runners: ASTM C 645.
 - a. Minimum Base-Metal Thickness: Minimum 0.018 inch (0.45 mm).
 - b. Depth: Minimum 1-5/8 inches (41 mm).
 - 3. Dimpled Steel Studs and Runners: ASTM C 645.
 - a. Minimum Base-Metal Thickness: Minimum 0.015 inch (0.38 mm).
 - b. Depth: Minimum 1-5/8 inches (41 mm).
 - 4. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22 mm) deep.
 - a. Minimum Base-Metal Thickness: minimum 0.018 inch (0.45 mm).
 - 5. Resilient Furring Channels: 1/2-inch- (13-mm-) deep members designed to reduce sound transmission.
 - a. Configuration: Asymmetrical or hat shaped.
- G. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
 - 1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
 - 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 - 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacing indicated, but not greater than spacing required by referenced installation standards for assembly types.
 - 1. Single-Layer Application: 16 inches (406 mm) o.c. unless otherwise indicated.
 - 2. Multilayer Application: 16 inches (406 mm) o.c. unless otherwise indicated.
 - 3. Tile Backing Panels: 16 inches (406 mm) o.c. unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.

- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Direct Furring:
1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
- F. Z-Furring Members:
1. Erect insulation, specified in Section 072100 "Thermal Insulation," vertically and hold in place with Z-furring members spaced 24 inches (610 mm) 600 mm o.c.
 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (305 mm) from corner and cut insulation to fit.
- G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.5 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacing indicated, but not greater than spacing required by referenced installation standards for assembly types.
 - 1. Hangers: 48 inches (1219 mm) o.c.
 - 2. Carrying Channels (Main Runners): 48 inches (1219 mm) o.c.
 - 3. Furring Channels (Furring Members): 16 inches (406 mm) o.c.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacing that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
 - 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - 4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - 5. Do not attach hangers to steel roof deck.
 - 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 - 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 - 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
- B. Related Requirements:
 - 1. Section 092216 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or blotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

- A. Regular wallboard: ASTM C36; 5/8" thick; flame spread 15; smoke developed 0; tapered long edges on the face side to form a shallow channel for joint reinforcement. Width shall be 4'; length 8', 9', 10', 12', 14', as job allows; natural finish face paper suitable for paint or other decoration.
- B. Fire-rated Wallboard; ASTM C36, type X, FS SS-L-30d, Type III, Grade X, Class 1; 5/8" thick; flame spread 15; smoke developed 0; tapered edges. Width shall be 4'; length 8', 9', 10', 12', 14', as job allows; natural finish face paper suitable for paint or other decoration.

2.3 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 1. Material: aluminum-coated steel sheet or rolled zinc.
 2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - f. Expansion (control) joint.
 - g. Curved-Edge Cornerbead: With notched or flexible flanges.

2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 1. Interior Gypsum Board: Paper.
 2. Exterior Gypsum Soffit Board: Paper.

3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 4. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping or drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 3. Fill Coat: For second coat, use setting-type, sandable topping or drying-type, all-purpose compound.
 4. Finish Coat: For third coat, use setting-type, sandable topping or drying-type, all-purpose compound.

2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- C. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.

- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8 inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2 inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Wallboard Type: Vertical surfaces unless otherwise indicated.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
5. Install High-Impact gypsum wallboard at the first eight feet (8') in the Fitness Center Room 232. Use special screws designed for this application.

C. Double Layer Application:

1. Install the first layer in the usual manner.
2. Stagger the second layer for an overlap of a minimum of 16".
3. Tape and float both inside and outside the elevator shaft.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners unless otherwise indicated.
 2. LC-Bead: Use at exposed panel edges.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 093100 – CERAMIC TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Ceramic Wall tile.
 - 2. Porcelain Ceramic Floor Tile.
 - 3. Tile accessories
- B. Related Sections include the following:
 - 1. Section 092500 Gypsum Wallboard

1.3 DEFINITIONS

- A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.
- B. Facial Dimension: Nominal tile size as defined in ANSI A137.1.

1.4 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
 - 1. Level Surfaces: Minimum 0.6.

1.5 SUBMITTALS

- A. Product Data: Within 90 calendar days of the Contractor's Notice to Proceed, for each type of product indicated.
- B. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of all accessories involving color selection.

1.6 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain all tile of same type and color or finish from one source or producer.

1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Installation Materials: Obtain all surface preparation products, waterproofing and anti-fracture membranes, thin-sets and grouts from a single source manufacturer. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:
 1. Waterproofing.
 2. Crack Isolation.
 3. Sound attenuation.
 4. Thin-set.
 5. Grout.
 6. Joint sealants.
 7. Cementitious backer units.
 8. Metal edge strips.
 9. Expansion joints for floor tile.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store liquid latexes and emulsion adhesives in unopened containers and protected from freezing.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.

2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
3. Basis-of-Design Product: The design for each tile type is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified. Color ranges must be close to that specified with final determination by the Architect.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.
- C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
 1. As selected by Architect from manufacturer's full range.
- D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.
- F. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by pre-coating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.
- G. Provide "Attic Stock" for each type, size, style and color of tile selected. Attic stock shall consist of a minimum of two standard boxes of tile for each type, size, style and color or 1% of the total area, whichever is greater.

2.3 TILE PRODUCTS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
- B. Available Manufacturers:
 1. Ceramiche Keope * (basis for design and color selection)
 2. Daltile; Div. of Dal-Tile International Inc.
 3. American Olean
 4. Substitutions per Architects approval.

C. Tile General Material:

1. Basis of specification American Olean
2. Composition: glazed porcelain tile.
3. Nominal Thickness: 1/4 inch.
4. Face: Pattern of design indicated.

D. CT-1 Glazed Porcelain Floor Tile I: Toilet Rooms: Ceramiche Keope; Style: Code: Color: Gray: 12"x24": Grout, Laticrete, 1/16" joint, Color 89 Smoke Grey

E. CT-2 Glazed Porcelain Floor Tile II: Showers; Ceramiche Keope; Style: Code: Color: Gray: 12"x12": Grout, Laticrete, 1/16" joint, Color 89 Smoke Grey

F. CWT-1 Glazed Porcelain Wall Tile at specific walls in Toilet Rooms, Ceramiche Keope; Style: Code: Color: Gray: 12"x12": Grout, Laticrete, 1/16" joint, Color 89 Smoke Grey

G. CTB-1 Glazed Porcelain Tile Base at Toilet Rooms and Showers: Ceramiche Keope; Style: Code: Color: Gray: 3"x12": Grout, Laticrete, 1/16" joint, Color 89 Smoke Grey.

2.4 SETTING AND GROUTING MATERIALS

A. Epoxy thin-set adhesive:

1. Basis of Design: Laticrete. Latapoxy 300 adhesive.

B. 100% Solids Epoxy Grout: ANSI A118.3.

1. Basis of Design: Spectralock Pro Premium Grout (Epoxy)

C. Grout colors per above schedule.

D. Grout lines shall be 1/16" maximum for floor and wall tiles.

2.5 MISCELLANEOUS MATERIALS

A. Cementitious Backer Board for walls: James Hardie cementitious board, 1/4" thick..

B. Travelable Underlayments and Patching Compounds: Latex-modified, Portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

C. Crack Isolation Membrane: Laticrete Blue 92, or a prior approved substitute.

D. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.

1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F (49 to 60 deg C) per ASTM D 87.

2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- E. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- F. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.
1. Available Products:
 - a. Basis of Design: Penetrating Grout Sealer by Custom Building Products.
 - b. Laticrete
 - c. Substitutions per Architects approval.

2.6 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Provide concrete substrates for tile floors installed with adhesives or thin-set mortar that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
 - 1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
 - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
- C. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- D. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCNA Installation Guidelines: TCNA's "Handbook for Ceramic Tile Installation." Comply with TCNA installation methods indicated in ceramic tile installation schedules. *Tile Council of North America*.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Jointing Pattern: Lay tile in grid pattern for floor and for wall, unless otherwise indicated. See elevations for more details. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
- F. Lay out tile wainscots to next full tile beyond dimensions indicated.
- G. Grout tile to comply with requirements of the following tile installation standards:
 1. For ceramic tile grouts (epoxy) , comply with ANSI A108.10.

3.4 WALL TILE INSTALLATION

- A. Install cement backer board per manufacturer's written instructions; stagger joints. Tape joints with fiberglass tape to bridge joints; Fill joints with adhesive then fully embed the tape.
- B. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCNA installation methods and ANSI setting-bed standards.
- C. Joint Widths: Install tile on walls with the following joint widths:
 1. Ceramic Tile: 1/16 inch (1.6 mm).

3.5 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 1. Remove cement grout residue from tile as soon as possible.
 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

3.6 FLOOR TILE INSTALLATION SCHEDULE

- A. Tile Installation: Interior floor installation on concrete on grade; thin-set mortar; TCA F113 and ANSI A108.5.
 - 1. Tile Type: porcelain tile.
 - 2. Thin-Set Mortar: Epoxy cement mortar.
 - 3. Grout: see above; 1/16" joints.
 - 4. See floor plans for finish Floor Patterns.

For above grade concrete floors, use TCNA Method 122 and add RedGuard Waterproofing and Anti-Fracture Membrane to Part 2.

3.7 WALL TILE INSTALLATION SCHEDULE

- A. Tile Installation: Interior wall installation over backer board; thin-set mortar; TCA W243 and ANSI A108.5.

END OF SECTION

SECTION 095000 ACOUSTICAL TREATMENT

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The provisions of all of the Contract Documents are hereby made a part of this Section.

1.02 STANDARDS

A. Meet requirements and recommendations of the applicable portions of the latest editions of Standards listed below.

1. American Society for Testing and Materials ASTM
2. Federal Specifications FS
3. Underwriters' Laboratories UL
4. Louisiana State Fire Marshall & NFPA 101 Life Safety Code

1.03 SUBMITTALS

A. Within 90 calendar days of the Contractor's Notice to Proceed, submit manufacturer's product data on all materials specified herein.

B. Submit two 6" x 6" samples of each type of acoustical material in this project.

C. Submit samples of the suspension system showing joining of main runners to cross members.

D. Submit samples showing the full range of colors for those materials which are specified with color choices.

PART 2 PRODUCTS

2.01 MANUFACTURERS

Armstrong, Conwed, Owens Corning, U.S. Gypsum, Chicago Metallic, Donn, or a prior approved substitute. Manufactures listed in this specification are used to denote type and quality of material required.

2.02 MATERIALS

A. Suspension Systems

1. Exposed Tee Grid: ASTM C-635, intermediate duty by Donn, DXL Series Snap Grid System, or prior approved substitute (white color).

- a. Main, Cross and Concealed Members:

1. Web Design: Double
 2. Cold-rolled Steel: Minimum thickness of 0.015 inches, electro zinc-coated factory painted low sheen satin white, 15/16 inch.
 3. All components and accessories shall be from one manufacturer.
- b. Edge Molding: Minimum 0.020 steel, channel or angle shaped with minimum flange width of 15/16 inch.
2. Aluminum Grid system: Donn AX system for use in shower areas for all of Training w.p. F111C, Restroom F112 and Showers F125. Include aluminum hanging wires.
- B. Rough Suspension:
1. Hanger wire: minimum 12 gauge galvanized, soft annealed, mild steel wire.
 2. Hanger clips: metal clamps for fastening carrying channels as required.
 3. Carrying channels: 16 gauge, 1-1/2" , cold rolled steel.
- C. Acoustical Units for Ceilings:
1. AC-1: General Ceilings: USG, Radar Panels; Item No. 2220. 24" x 24" x 5/8" mineral fiber, Shadowline Tapered edge; lay-in panels or prior approved substitute. N.R.C.: .55 C.A.C. of 33: LR .87: Class A, flame Spread, 0-25 (ASTM E 84). 30 year warranty; Color, White.

PART 3 EXECUTION

3.01 INSTALLING

- A. Suspension systems: ASTM C-636. Hanger inserts shall be installed as recommended by the manufacturer, hanger wires at 4 feet o.c. each direction, with additional hanger wires at ends of each suspension member and at light fixtures 6" from vertical surfaces. Install main and cross runners, and wall molding according to manufacturer's recommendations, level and square to adjacent walls.
- B. Each fluorescent light fixture shall have a minimum of two hangers at opposite corners per State Fire Marshal requirements.
- D. Acoustical Units for Ceilings:
1. Install in level plane in straight line courses with materials bearing all around on suspension members.
 2. Minimum Width of Border Tiles: one-half (1/2) unit dimension or as shown on Drawings.

3. Install acoustical units at grilles and recessed lights with hold-down clips to prevent movement or displacement of units.
4. Coordinate locations of ceiling expansion joints.
5. Provide a minimum of two extra boxes of each ceiling tile type for "attic storage"

END

SECTION 096513 - RESILIENT ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Resilient base.
 - 2. Resilient molding accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches (300 mm) long.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches (300 mm) long.
- E. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet (3 linear m for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.6 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE

- A. Approved Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Roppe.
 - 2. Burke Mercer.
 - 3. Flexco.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide the following, or comparable product:
 - 1. Roppe.
- C. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
 - 1. Style and Location:
 - a. Style B, Cove: Provide in areas with resilient flooring.
- D. Thickness: 0.125-inch (3.2 mm).

- E. Height: 4-inches (102 mm).
- F. Lengths: Coils in manufacturer's standard length.
- G. Outside Corners: Preformed.
- H. Inside Corners: Preformed.
- I. Colors: Roppe Pinnacle Standard Toe 195 Light Gray (**MATCH EXISTING -VOJ**).

2.2 MOLDING ACCESSORIES, GENERAL

- A. Provide resilient molding accessories from the same manufacturer as the resilient base.

2.3 RUBBER MOLDING ACCESSORIES

- A. Approved Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Roppe.
 - 2. Burke.
 - 3. Johnsonite.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide the following, or comparable product:
 - 1. Roppe.
- C. Description: Carpet edge for glue-down applications, nosing for resilient flooring, reducer strip for resilient flooring, joiner for tile and carpet, and transition strips.
- D. Profile and Dimensions: As indicated on Drawings.
- E. Locations: Provide rubber molding accessories in areas indicated on Drawings.
- F. Colors and Patterns: As selected by Architect from full range of industry colors.

2.4 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less.

2. Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners are not allowed.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.
 - 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Humidity Testing.
2. Leveling and Patching Compound.
3. Vinyl composition floor tile.
4. Extended Warranties based on manufacturer's approved qualifying systems.

- B. Related Sections:

Section 096513 "Resilient Accessories" for resilient base, reducer strips, and other accessories installed with resilient floor coverings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 1. Show details of special patterns.
- C. Samples: Full-size units of each color and pattern of floor tile required.
- D. Samples for Initial Selection: For each type of floor tile indicated.
- E. Samples for Verification: Full-size units of each color and pattern of floor tile required.
- F. Product Schedule: For floor tile. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockups for floor tile including demolition of existing wood flooring, demolition of sleepers, concrete infill and welded wire fabric reinforcing, Leveling and Patching Compounds, base, shoe molding, and accessories. Concrete infill shall be cured, and dried, to specified number of days or if not specified, then for a minimum of 14 days.
 - a. Size: Minimum 100 sq. ft. (9.3 sq. m) for each in locations directed by Architect.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
 - 4. Perform Humidity Test on concrete infill prior to installation.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.9 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.
- F. Perform Humidity Tests prior to installation of floor tile. Do not proceed with approval of test results.

1.10 Warranty:

- A. Comply with approved adhesive system to qualify for Hydraulic Cement Underlayment, and Moisture Vapor Emission Control System Extended Warranties.
- B. Warranty Period: 20-Years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. FloorScore Compliance: Resilient tile flooring shall comply with requirements of FloorScore certification.

2.2 VINYL COMPOSITION FLOOR TILE

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Armstrong World Industries, Inc.
 2. Azrock.
 3. Tarkett, Inc.
 4. Pre-Approved Equal.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide the following, or comparable product:
1. Tarket Expressions Standard VCT.
- C. Tile Standard: ASTM F 1066, Class 2, through-pattern tile.
- D. Wearing Surface: Smooth.
- E. Thickness: 0.125 inch (3.2 mm).
- F. Size: 12 by 12 inches (305 by 305 mm).
- G. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 TROWELABLE LEVELING AND PATCHING COUMPOUND

- A. Manufacturer: Provide products by a manufacturer approved to qualify for Hydraulic Cement Underlayment, and Moisture Vapor Emission Control System Extended Warranties.
- B. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

2.4 ADHESIVE

- A. General: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated to qualify for manufacturer's Extended Warranties.
1. Adhesives shall comply with the following limits for VOC content:
 - a. Vinyl Composition Tile Adhesives: 50 g/L or less.
- B. Manufacturers: Subject to compliance with requirements, provide products of one of the following manufacturers:
1. Aquaflex.
 2. Henry.
 3. Pre-Approved Equal.

- C. Basis of Design: For purposes of specifying type and quality, drawings and specifications are based on Henry 430 ClearPro.

- 1. Comply with ARDEX/Henry SystemOne requirements.

2.5 MISCELLANEOUS INSTALLATION MATERIALS

- A. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 to 10 pH as recommended by the manufacturer.
 - 4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-

vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.

- b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles square with room axis.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles with grain direction alternating in adjacent tiles (basket-weave pattern).
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

- H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
 - 1. Apply three coat(s).
- E. Joint Sealant: Apply sealant to resilient terrazzo floor tile perimeter and around columns, at door frames, and at other joints and penetrations.
- F. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 096800 - CARPET

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Tufted loop carpet.
 - 2. Adhesives, Seam Sealers & Accessories
- B. Related Sections include the following:
 - 1. None: see this spec for base and associated rubber goods.

1.3 SUBMITTALS

- A. Product Data: Within 90 days of the Notice to Proceed, and for each type of product indicated submit all product data shop drawings and samples. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation recommendations for each type of substrate required.
- B. Shop Drawings: Show the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet.
 - 2. Seam locations, types, and methods.
 - 3. Pattern type, repeat size, location, direction, and starting point.
 - 4. Type, color, and location of insets and borders.
 - 5. Transition details to other flooring materials.
- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Carpet: 24" x 24" carpet tiles.
- D. Product Schedule: Use same room and product designations indicated on Drawings and in schedules.

- E. Maintenance Data: For carpet to include in maintenance manuals specified in Division 1. Include the following:
 - 1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - 2. Precautions for cleaning materials and methods that could be detrimental to carpet.

1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Product Options: Products and manufacturers named in Part 2 establish requirements for product quality in terms of appearance, construction, and performance. Other manufacturers' products comparable in quality to named products and complying with requirements may be considered.

1.5 PROJECT CONDITIONS

- A. General: Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity."
- B. Environmental Limitations: Do not install carpet until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

1.6 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Carpet Warranty: Written warranty, signed by carpet manufacturer agreeing to replace carpet that does not comply with requirements or that fails within specified warranty period. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, and delamination.
 - 1. Warranty Period: Lifetime Commercial Limited warranty; refer to each specific product for warranty information.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet: Boxes equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The Shaw Contract, Mohawk Group - Lee's Carpet, Tandus, Mannington or a prior approved substitute. Manufacturer listed in this specification is used to denote type, quality and pattern of material required.

2.2 MATERIALS

- A. Product: Subject to compliance with requirements, provide the following:
 - 1. CPT-1, Shaw Contract, Modular tile 24" x 24"; quarter turn installation
 - a. Product: Byline 59113
 - b. Color: Boundaries 05505 OR as selected by the architect (two colors to be selected)
 - c. Construction: Multi-level pattern loop
 - d. Dye Method: 100% solution dyed
 - e. Gauge: 1/12"
 - f. Stitches per inch: 9 per inch
 - g. Pile Height: .094"
 - h. Total thickness: 0.236"
 - i. Fiber: Eco solution q nylon
 - j. Primary Backing: synthetic
 - k. Secondary Backing: Ecoworx tile
 - l. Face Yarn Weight: 17 oz.
 - m. Size: 24" x 24" tile
 - n. Protective Treatments: SSP Shaw soil protection
 - o. Radiant Panel: Class 1
 - p. NBS Smoke: less than 450
 - q. Electrostatic Propensity: less than 3.5 kv
 - 2. Substitutions: none

2.3 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided by or recommended by the carpet manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, non-staining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and that is recommended by the carpet manufacturer.
- C. Seaming Cement: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams. Manufacturer's recommendation: Everseal for moisture over 5 lbs per 1000 SF; Sure seal for any old cut or multipurpose adhesive problem issues; Mohawk Life Lock Seam Sealer
- D. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

2.4 BASE ACCESSORY: RESILIENT WALL BASE

- A. Wall Base: ASTM F 1861.
 - 1. Johnsonite; TightLock Carpet Rubber wall base.
 - 2. Type (Material Requirement): Rubber.
 - 3. Style: TCB-XX.
 - 4. Minimum Thickness: 0.125 inch.
 - 5. Height: 4 inches.
 - 6. Colors: as selected by the architect.
 - 7. Lengths: Coils in manufacturer's standard length.
 - 8. Outside Corners: Job formed with minimum 6" each side.
 - 9. Inside Corners: Job formed.
 - 10. Surface: Smooth.
- B. Latex primer: Shaw's 9050

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Verify that substrates and conditions are satisfactory for carpet installation and comply with requirements specified by the manufacturer.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness

- characteristics by performing bond and moisture tests recommended by the carpet manufacturer.
- 2. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and carpet manufacturer's written installation instructions for preparing substrates indicated to receive carpet installation.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by the carpet manufacturer.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. Products:
 - 1. Ecoworx ES are peel n stick systems. Subfloor must be completely free of debris that could contaminate the applied adhesive.
 - 2. Install latex primer in accordance with the manufacturer's instructions prior to carpet installation.
- B. Comply with carpet manufacturer's written recommendations for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.
- C. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, and thresholds,. Bind or seal cut edges as recommended by carpet manufacturer.
- D. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- F. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
 - 2. Remove yarns that protrude from carpet surface.
 - 3. Vacuum carpet using commercial machine with face-beater element.
- B. Protect installed carpet to comply with CRI 104, Section 15, "Protection of Indoor Installations."
- C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer.

END OF SECTION 096800

SECTION 099123 – PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Steel and iron.
 - 2. Gypsum board.
 - 3. Concrete.
- B. Related Requirements:
 - 1. Section 051200 "Structural Steel Framing" for shop priming structural steel.
 - 2. Section 055000 "Metal Fabrications" for shop priming metal fabrications.

1.3 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run,] that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Approved Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products of the following manufacturers:
 - 1. Glidden.

2. Pittsburg Paint.
3. Sherwin Williams.

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction. and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base:
 1. Flat Paints and Coatings: 50 g/L.
 2. Nonflat Paints and Coatings: 150 g/L.
 3. Dry-Fog Coatings: 400 g/L.
 4. Primers, Sealers, and Undercoaters: 200 g/L.
 5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
 6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
 7. Pretreatment Wash Primers: 420 g/L.
 8. Floor Coatings: 100 g/L.
 9. Shellacs, Clear: 730 g/L.
 10. Shellacs, Pigmented: 550 g/L.
- D. Colors: As selected by Architect from manufacturer's full range.
 1. Ten percent of surface area will be painted with deep tones.

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
 1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 2. Testing agency will perform tests for compliance with product requirements.
 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from

previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete and Masonry: 12 percent.
 - 2. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Aluminum Substrates: Remove loose surface oxidation.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in equipment rooms:

- a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.
2. Paint the following work where exposed to view in occupied spaces:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - h. Other items as directed by Architect.
3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. Interior Unfinished Concrete Masonry Units Exposed to view:

1. Acrylic System:

a. Filler: Acrylic.

1) Heavy Duty Block Filler @ 10 mils dft.

b. Prime Coat: Acrylic.

1) Loxon Concrete & Masonry Primer/Sealer @ 3 mils dft.

c. 1st Coat: Acrylic.

1) Pro-Industrial Pre-Catalyzed Waterbased Epoxy @ 2.0 mils dft., Eg-Shel.

B. Gypsum Board:

1. Latex System:

a. Prime Coat: Latex.

1) Promar 200 Latex Primer.

b. 1st Coat: Latex.

1) Promar 200 Interior Latex Finish, B20 Series, Eg-Shel.

c. 2nd Coat: Latex.

1) Promar 200 Interior Latex Finish, B20 Series, Eg-Shel.

END OF SECTION 099123

SECTION 101600 TOILET PARTITIONS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

- A. This section includes solid plastic HDPE thru color toilet partitions consisting of partitions, urinal screens, shower stalls and dressing compartments.

1.02 RELATED SECTIONS

- A. Section 09250: Gypsum Wallboard (14 ga metal grounds and double studs)
- B. Section 10800: Toilet and Bath Accessories

1.03 SUBMITTALS

- A. Shop Drawings: Within 90 days of the Notice to Proceed, submit all data and layout of toilet partitions.
- B. Product Data: Manufacturer's catalog cuts of typical panel, pilaster, door, hardware and fastenings.
- C. Color Chips: Manufacturer's complete range of standard colors for high density polymer.
- D. Verification Samples: Sample of actual specified plastic chip for color and texture verification.

1.4 QUALITY ASSURANCE

- A. Components of toilet partitions shall be sourced from one single-source manufacturer who certified that materials meet or exceed specifications.
- B. Installation: Installer shall have a history of completed jobs of similar size and scope and shall be qualified.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Pre-finished materials shall be delivered to the job site in original, unopened cartons or other packaging materials necessary to protect structure and finishes. Materials shall be stored in manufacturer's packaging until installation. Partitions shall be stored in horizontal position with adequate support to ensure flatness and to prevent damage to pre-finished surfaces.

1.6 PROJECT CONDITIONS

- A. Building shall be enclosed and provide complete protection from outside weather. Temperature within building shall be above a minimum of 60°F and below 100°F.

1.7 WARRANTY

A. Manufacturer shall provide a 10-year warranty against corrosion, breakage and delamination of plastic material under normal conditions.

PART 2 –PRODUCTS

2.1 MANUFACTURER

A. General Partitions, Bradley, Ampco, American Sanitary Partition Corp or a prior approved substitute. Materials must be high density polymer with thru-color.

2.2 EQUIPMENT

A. H.D.P. (High Density Polymer) toilet partitions are based on Bradley, 400 Series, floor mounted, overhead brace.

2.3 COMPONENTS

- A. Panels — Shall be 1" thick (55in. high) solid high density polyethylene formed under pressure. Solid color throughout. All edges to be machined radius and all sharp edges removed.
- B. Doors — Shall be 1" thick (55in. high) solid high density polyethylene formed under pressure. Solid color throughout. All edges to be machined radius and all sharp edges removed.
- C. Pilasters – Shall be 1" thick, same construction as doors. Pilasters are to be anchored to the floor with heavy gauge angle. Top of pilasters to be securely braced with extruded aluminum headrail with integral crown loafer rail.
- D. Headrail — To be 1 7/8in. x 1 1/32in. x 1/16in. with integral crown loafer rail, extruded aluminum heat-treated and anodized with necessary fittings.
- E. Hardware: all stainless steel with satin brushed finish; all stainless steel torx head fasteners: NO ZAMAC or POT METALS

1. Door Hardware – Shall be gravity cam-action continuous hinge that permits door to return to a preset position when not locked. Hinge, strike and keeper shall be stainless steel to resist corrosion and through bolted with tamper resistant barrel nuts and shoulder screws. The closing position of each hinge shall be fully adjustable. Hinges shall be properly lubricated for free swing action.

2. Latches shall be fabricated from heavy-duty stainless steel. . Slide bolt shall have a brushed aluminum finish. Latch is mounted to the door with stainless steel theft-resistant bolts.

3. Keeper shall be 2½" long and fabricated from heavy-duty stainless steel. No strike hardware is required because the overlap feature acts as a door stop.

4. Coat hooks, door bumpers, and door pulls shall be provided in stainless steel with a satin finish. Integral hinge doors 32"–36" wide shall be supplied with an individual coat hook, door bumper, and door pull. In-swing ADA and out-swing doors shall be supplied with a double door pull.

5. Mounting Hardware shall be heavy duty continuous stainless steel wall brackets with brushed finish; shall be secured to walls and pilasters with stainless steel tamper resistant fasteners. Panels shall be through bolted with tamper resistant barrel nuts and shoulder screws. All fasteners shall be stainless steel torx head with pin.

F. Pilaster trim to be 4 in. high, 300 Series stainless steel with #4 satin brushed finish. All hardware and fittings to be secured with vandal-proof torx-head screws.

2.4 COLOR SELECTION

Toilet Rooms: Color: as selected by the architect. Provide full range for selection.

Part 3 – EXECUTION

3.1 INSPECTION

A. Before installation, the installer shall inspect the site to ensure that no defects or conditions exist which would result in an unsatisfactory installation of the partitions. Measurements should also be taken at this time to further ensure correct installation.

B. Inspect for proper grounds for securing panels to gypsum wallboard walls.

3.2 INSTALLATION

A. Installers must allow 24 hours for material to adjust to the site environment. Banding, stretch wrap and cardboard should be removed.

C. Install partitions, screens, dressing compartments and enclosures in accordance with shop drawings and manufacturer's current installation instructions. Leave compartments complete, clean and free from defects in workmanship.

D. Install panel or locate out swinging doors to prevent their opening more than 105°.

E. Coordinate installation of Toilet Accessories.

F. Doors and hardware shall be thoroughly adjusted and left in proper working condition. Set doors in open or close position as required.

3.3 CLEANING

A. All rubbish and cartons generated by installer shall be removed from the site.

END

SECTION 102000 LOUVERS AND VENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

- A. The provisions of all of the Contract Documents are hereby made a part of this Section.
- B. This specification includes exterior outside- air intakes and exhaust units. Coordinate percent % opening requirements with mechanical design.
- C. Refer to Section 02720 for Louvered Fences and Gates.

1.02 STANDARDS

A. Meet requirements and recommendations of the applicable portions of the latest editions of standards listed below:

- 1. Federal Specifications FS
- 2. American Society for Testing and Materials ASTM
- 3. Aluminum Association AA
- 4. Underwriters Laboratories UL

1.03 SUBMITTALS

- A. Within 90 days of the Notice to Proceed, Submit complete Shop Drawings and Product Data for review by the Architect.
- B. Submit samples of manufacturer's complete color range for selection by the Architect.
- C. Submit samples of each product upon Architect's request.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. American Warming and Ventilating, Airolite, Construction Specialties, Greenheck (6" ESD-635D) hurricane rated) or a prior approved substitute.

2.02 MATERIALS

A. Louver type I: exterior fixed formed metal installed in **aluminum frame**; louvers shall be equal in material, profile, and construction to American Warming and Ventilating Model LE-32 with frame.

- 1. Frame shall be 6" deep.
- 2. Frames shall be .081" aluminum, channel and blades shall be .081" aluminum at 45 degree angle.
- 3. Blades shall be drainable type. Jambs shall be constructed with integral downspouts for carrying water from the blades to the louver sill.

4. Louvers shall have integral bird screens at intake ducts. Other areas beyond duct to be blanked off.
5. Louver to have intermediate mullion as required to meet wind load.
6. Louver finish shall be factory primed; painting as specified in Section 09900 - Painting.

PART 3 EXECUTION

3.01 INSPECTION

The installer must examine the areas and conditions under which louvers and associated items are to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.02 INSTALLATION

- A. Locate and place louver units plumb, level, and in proper alignment with adjacent work.
- B. Use concealed anchorages wherever possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weather-tight connection.
- C. Form tight joints with exposed connections accurately fit together. Provide reveals and opening for sealants and joint fillers, as shown.
- D. Repair finishes damaged by cutting, welding, soldering and grinding operations required for fitting and jointing. Restore finishes and prime coats of paint so that there is no evidence of corrective work. Return items which cannot be refinished in the field to the shop, make the required alterations, and refinish the entire unit, or provide new units, at the Contractor's option.

END OF SECTION

SECTION 102116.19 - PLASTIC SHOWER AND DRESSING COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Solid-plastic compartments.
- B. Related Requirements:
 - 1. Section 061053 "Miscellaneous Rough Carpentry" for blocking and support of floor-and-ceiling-anchored compartments.
 - 2. Section 102800 "Toilet, Bath, and Laundry Accessories" for grab bars, purse shelves, and similar accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For shower and dressing compartments.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Show locations of cutouts for compartment-mounted accessories.
 - 3. Show locations of centerlines of drains.
- C. Samples for Initial Selection: For each type of compartment material indicated.
 - 1. Include Samples of hardware and accessories for material and color selection.
- D. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
 - 1. Each type of material, color, and finish required for compartments, prepared on **6-inch-(152-mm-)** square Samples of same thickness and material indicated for the Work.
 - 2. Each type of hardware and accessory.

3. Curtain Fabric: 12-inch- (305-mm-) square swatch or larger as required to show complete pattern repeat, from dye lot used for the Work, with specified treatments applied. Mark top and face of material.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of shower and dressing compartment.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For shower and dressing compartments to include in maintenance manuals.

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of fixtures, drains, walls, columns, ceilings, and other construction contiguous with shower and dressing compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 450 or less.
- B. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities for shower and dressing compartments designated as accessible.

2.2 SOLID-PLASTIC COMPARTMENTS

- A. Basis of Design: Comfort Designs SSS 3637 BF 3P RRF Solid Surface Alcove Three-Piece Shower.
- B. Configuration: Shower compartment as indicated on Drawings.
- C. Enclosure Style: Floor and ceiling anchored.

2.3 MATERIALS

- A. Stainless Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.

- B. Stainless Steel Castings: ASTM A 743/A 743M.

2.4 ACCESSORIES

- A. Curtain Rod with Hooks: Manufacturer's standard, 1-inch- (25-mm-) diameter, stainless steel curtain rod with matching hooks.
- B. Curtain: Flame-resistant, polyester-reinforced vinyl fabric that is stain resistant, self-sanitizing, antistatic, antimicrobial, and launderable to a temperature of not less than 90 deg F (32 deg C)
 - 1. Flame Resistance: Passes NFPA 701 tests when tested by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Labeling: Identify fabrics with appropriate markings of applicable testing and inspecting agency.
 - 3. Curtain Grommets: Two-piece, rolled-edge, rustproof, nickel-plated brass; spaced not more than 6 inches (152 mm) o.c.; machined into top hem.
 - 4. Width: Minimum 12 inches (305 mm)] wider than opening.
- C. Soap Holder: Recessed, seamless soap dish.
- D. Seats: Manufacturer's standard, wall-mounted and floor-mounted benches.
 - 1. Material: Wood and Solid phenolic
 - 2. Operation: Fixed benches in dressing areas and Folding bench in ADA showers.
 - 3. Finish: As selected by Architect from manufacturer's full range
- E. Anchorages and Fasteners: Manufacturer's standard, exposed fasteners of stainless steel, chrome-plated steel, or solid brass, finished to match the items they are securing; with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. Use countersunk, flush-type bolt heads or otherwise make fasteners inconspicuous if exposed on opposite side of panel from hardware or accessory item. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

2.5 FABRICATION

- A. Floor-and-Ceiling-Anchored Compartments: Manufacturer's standard, corrosion-resistant anchoring assemblies at pilasters and walls, with leveling adjustment at tops and bottoms of pilasters. Provide shoes and sleeves (caps) at pilasters to conceal anchorage.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install compartments rigid, straight, level, and plumb. Secure compartments in position with manufacturer's recommended anchoring devices.

1. Clearances for Dressing Compartments: Maximum **1/2 inch (13 mm)** between pilasters and panels; **1 inch (25 mm)** between panels and walls.
- B. Floor-and-Ceiling-Anchored Compartments: Secure pilasters to supporting construction, and level, plumb, and tighten.
- C. Curtains: Install curtains to specified length, and verify that they hang vertically without stress points or diagonal folds.

3.2 ADJUSTING

- A. Curtain Adjustment: After hanging curtains, test and adjust each track or rod to produce unencumbered, smooth operation. Steam and dress down curtains as required to produce crease- and wrinkle-free installation. Remove and replace curtains that are stained or soiled or that have stress points or diagonal folds.

END OF SECTION 102116.19

SECTION 107320 - METAL AWNINGS AND CANOPIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Metal Awnings and Canopies of the following types:
 - 1. Standard Canopy with Channel Fascia. (LFS-FLCA).
 - 2. Delegate Design Calculations.

1.3 RELATED SECTIONS

- A. Section 05120 - Structural Steel.
- B. Section 05400 - Cold-Formed Metal Framing.
- C. Section 07620 - Sheet Metal Flashing and Trim.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data:
 - 1. Manufacturer's data sheets on each product to be used.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Typical installation methods.
- C. Verification Samples: Two representative units of each type, size, pattern and color.
- D. Shop Drawings: Include details of materials, construction and finish. Include relationship with adjacent construction.
- E. Engineering Calculations: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to the design Metal Canopies.
 - 1. Provide Design calculations signed and sealed by an engineer licensed in the state the canopy is installed.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum ten years documented experience.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience with projects of similar scope and complexity, and approved by Manufacturer.
- C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
- D. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
 - 1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
 - 2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
 - 3. Retain mock-up during construction as a standard for comparison with completed work.
 - 4. Do not alter or remove mock-up until work is completed or removal is authorized.
- E. Engineering Calculations:
 - 1. Delegated-Design Submittal: For extruded aluminum canopies.
 - 2. Provide Design calculations signed and sealed by an engineer licensed in the state the canopy is installed that the Metal Canopies have been designed to withstand the Wind Loads in the Region the Canopies will be installed.

1.6 PRE-INSTALLATION CONFERENCE

- A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
- B. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 WARRANTY

- A. Manufacturer's Warranty: Aluminum frames are warranted against defects in workmanship for five (5) years from date of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
1. C.R. Laurence Co. Inc.
 2. Lawrence Fabric and Metal Structures, Inc.
 3. Mapes Architectural Canopies, LLC.
 4. Pre-Approved Equal.
- B. Basis of Design: Lawrence Fabric and Metal Structures Inc., which is located at: 3509 Tree Court Industrial Blvd.; St. Louis, MO 63122; Phone: 636-861-0100; Email: sales@lawrence-fabric.com; Web: lawrencefabric.com [Click Here](#) for more information.
- C. Substitutions:
1. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 METAL AWNINGS AND CANOPIES

- A. Performance and Design Requirements:
1. Standards Compliance: Comply with local building codes.
- B. Standard Canopy, Basis of Design: LFS-FLCA Canopy; as manufactured by Lawrence Fabric and Metal Structures Inc.
1. Material: Extruded aluminum, alloy 6063-T6.
 2. Fabrication Method: Welded and mechanically fastened.
 3. Fascia: G-style gutter fascia.
 - a. Welded as one piece or in sections as required for width of canopy.
 - b. Profile: 12 inches.
 4. Decking: Aluminum interlocking pan.
 - a. Profile: M-Core.
 5. Water Dispersal:

- a. Include Sleeve to Accommodate Downspout, and Downspouts.
- 6. Support: Hanger Rods:
 - a. 1.0 Inches Stainless Steel Rod with Clevis Assembly.
- 7. Finishes
 - a. AAMA 2605 AAMA 2605 Compliant Finish: 10-Year Warranty.
 - b. Color: As Selected from Manufacturer's Premium Finishes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly constructed and prepared.
- B. Confirm dimensions and elevations.
- C. Verify that wall structure can support canopy loads.
- D. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

3.5 CLEANING AND PROTECTION

- A. Clean products in accordance with the manufacturer's recommendations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

CONSTRUCTION DOCUMENT 100% SUBMITTAL
JEFFERSON PARISH SHERIFF'S OFFICE
WAREHOUSE TORNADO REPAIRS

JUNE 9, 2023
N-Y JOB NO.: 21023

END OF SECTION 105113

SECTION 108000 TOILET AND BATH ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Toilet [and related] accessories.

B. Related Sections:

1. Section 092500 Gypsum Wallboard
2. Section 061000 - Rough Carpentry: Blocking for attachment of wall-mounted accessories.
3. Section 101500 - Toilet Compartments: Cut-outs for units mounted in toilet partition walls.

1.02 REFERENCES

- A.** American Society for Testing and Materials, ASTM A167 – Stainless and Heat-Resisting Chromium Nickel Steel Plate Sheet, and Strip.

1.03 SUBMITTALS

- A.** Within 90 calendar days of the Notice to Proceed, provide submittals in accordance with Conditions of the Contract and Section 01330 - Submittal Procedures.
- B.** Product Data: Submit manufacturer's product data sheet and dimensioned illustration of each product. Indicate options to be furnished and installation requirements.
- C.** Solid Laminate Color Samples: Submit samples of colors selected by Architect.

1.04 DELIVERY, STORAGE AND HANDLING

- A.** Deliver, store, and handle products in accordance with Section 01600 - Product Requirements. Deliver in original, unopened packaging. Store in dry location. Handle to prevent damage.

1.05 WARRANTY

- A.** Provide Warranty in accordance with Section 01700 -Execution Requirements
- B.** Mirrors: Furnish manufacturer's 15 year limited warranty against silver spoilage for first quality glass mirrors which are triple-silvered and electro-copper plated with baked enamel backing.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A.** Bradley Corporation, P.O. Box 309, Menomonee Falls, WI 53052-0309.
Phone 800-BRADLEY (800-272-3539); Fax: 262-251-5817
<http://www.bradleycorp.com>. ; Bobrick or a prior approved substitute.

B. Substitutions: Section 016400– Substitutions and Product Options.

2.02 MATERIALS

- A. Stainless Steel: ASTM A167 Type 304 (18-8); satin finish exposed surfaces unless otherwise specified.
- B. Locks: Tumbler locks keyed alike.
- C. Provide corrosion resistant fasteners and attachment devices, and other fittings necessary to assure function and operation of accessories.

2.03 FABRICATION

- A. Units shall be neatly and rigidly assembled, uniformly finished, and free from burrs and rough edges.

2.04 ACCESSORIES

- A. Framed Mirrors: Glass & stainless steel frame, Bobrick Model No.165 - 18" W x 36"H
- B. Grab Bars: Straight, 1½ inches (38 mm) o.d., Stainless Steel, Bradley Model No. 812; size as indicated on the drawings. (18", 36", 42")
- C. PTDD Paper towel dispenser and disposal: Bobrick Model 38032; Cabinet 18-8, type 3-4 heavy gauge stainless steel, all welded construction.
 - 1. Door same material with satin finish and concealed full length stainless steel piano hinge and stainless steel chain limiter and two tumbler locks.
 - 2. Paper Towel Dispenser 18-8, type 304 stainless steel with satin finish; rounded towel tray with hemmed opening; Capacity: 600 C-fold, 800 Multifold, or 1100 single-fold paper towels.
 - 3. Waste Container: Leak-proof molded plastic container; removable for servicing; capacity 5.6 gal.
- D. CH Coat Hooks: Bobrick Model B-670; bright polished stainless steel.
- E. SD Soap Dispenser: Bobrick B-2111 vertical tank satin finish stainless steel; valve dispenses all-purpose hand soap. 40 fl oz., soap refil window, concealed wall fastening hinged filler top with special key.
- F. TPH Toilet Paper Holders: Bobrick B-2743; cast aluminum satin finish; plastic spindles, concealed locking device holds two rolls up to 6" diameter.
- G. Mop & Broom Holders, Surface Mounted, Bobrick No. F-223 x 24" install in custodian's room per owner's instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify substrates and blocking for attachment of wall-mounted accessories are ready for installation of accessories.

3.02 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions. Install plumb, level, and rigidly anchored to substrates.

B. Where Drawings or Schedule require barrier-free accessibility, install accessories in accordance with applicable regulations.

3.03 ADJUSTING AND CLEANING

A. Protect accessories from damage due to construction. Remove protective coverings when no longer required.

B. Test accessories and adjust for proper operation.

C. Clean exposed surfaces.

3.04 ROOM ACCESSORY HEIGHT COMMENTS

A. Mount all components as indicated on the drawings or as required by ADAAG.

B. Note the mirrors should be mounted so that the mirror itself (not the frame) is no higher than 40".

END OF SECTION

SECTION 200000 - MECHANICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract apply to the work specified in DIVISION 15 - MECHANICAL.

B. Separation of Division 15 into Sections is for convenience only and is not intended to establish limits of work. Sections are as follows:

1. 200000 - MECHANICAL GENERAL PROVISIONS
2. 211000 - FIRE PROTECTION SYSTEMS
3. 230500 - HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS
4. 230900 - HEATING, VENTILATING AND AIR CONDITIONING CONTROL SYSTEMS

1.2 SCOPE

A. Provide labor, materials and equipment for complete and operating systems.

1.3 CUTTING AND PATCHING

A. Cutting and patching for the work of this Division shall be in accordance with the requirements of the General Conditions. Work of this Division shall include providing information for any required openings to those responsible for concrete slabs and other concrete members. Openings associated with work of this Division not indicated or specified in other Divisions, shall be work of this Division. Field cut openings shall be located to avoid the reinforcing. Locations of field cut openings in slabs and structural members shall not proceed without the written approval of the Architect/Engineer.

1.4 DRAWINGS

The drawings are diagrammatic and are intended to show the general arrangement and approximate physical sizes of equipment, piping and ductwork. Every nut, bolt, brace, hanger, piping or duct rise, drop, offset, etc., is not indicated or specified. Each item (required, necessary or incidental, for the proper and dependable operation of each system) shall be provided under this Division whether specifically referred to or not. Refer to architectural drawings for necessary dimensions and to shop drawings and submittals for physical size of equipment.

1.5 CODES AND PUBLICATIONS

A. Work shall be executed in accordance with the presently enforced Codes and Publications which shall include but shall not be limited to the following:

1. Jefferson Parish Building Code
2. Jefferson Parish Gas Code
3. Jefferson Parish Mechanical Code
4. Jefferson Parish Plumbing Code
5. International Building Code
6. Louisiana State Plumbing Code
7. ASPE Data Book
8. ASHRAE Publications
9. Louisiana State Fire Marshal Act
10. SMACNA, Sheet Metal and Air Conditioning Contractors National Association
11. NFPA 13 - Sprinkler Systems
12. NFPA 54 - National Fuel Gas Code
13. NFPA 70 - National Electrical Code
14. NFPA 90A - Installation of Air Conditioning & Ventilating Systems
15. NFPA 101 - Life Safety Code

B. Where the above are at variance with the Contract Documents, the more stringent requirements shall be applicable.

1.6 REVIEWS, PERMITS AND INSPECTIONS

A. Equipment installed outdoors shall be installed at or above the FEMA Base Flood Elevation (BFE). Obtain flood elevation from a licensed surveyor and pay the cost associated therewith. Provide documentation to the Architect/Engineer to confirm that this requirement will be met. Buildings that are built with the floor slab exceeding the FEMA BFE shall have outdoor equipment installed at elevations indicated on the Contract Documents, however, should these elevations be at variance with the FEMA BFE the equipment shall still be installed at or above the FEMA BFE.

B. Apply for and pay for governmental and regulatory agency reviews, permits and inspections. Provide plumbing riser diagrams, sketches, etc. as required by regulatory agencies for permit issuance. No work shall be concealed until approved by the governmental or regulatory agency inspectors and the Architect/Engineer. Local regulations shall be adhered to. Upon completion, a Certificate of Approval from the appropriate regulatory agencies shall be provided the Architect/Engineer.

1.7 FEES AND DEPOSITS

A. Arrange for and pay regulatory inspection and service connection fees (sewer, drainage, water, and gas). Pay meter deposits for utility services. After substantial completion of the project, the meter registration shall be transferred to the Owner.

1.8 VISITING SITE

A. The Bidder shall visit the site of proposed work so that he may understand the facilities, difficulties, and restrictions attending the execution of the Contract. No additional compensation will be allowed for failure to be so informed.

1.9 WORK IN OTHER DIVISIONS

A. Prior to bidding, the Contractor shall coordinate items of work referred to as **"work of other Divisions"** to insure items are not omitted or duplicated.

1. Electrical work (wiring, raceways and disconnect switches), fire alarm work (wiring, raceways, equipment and devices) associated with work of this division and not specified as work of Division 16 - Electrical, shall be work of this division.

2. Supports for work of this Division, except supports specifically indicated to be provided under other Divisions, shall be provided as work of this Division. Supports provided under other Divisions shall be checked and coordinated under this Division to ensure that they suit the work to be installed.

3. Painting, including painting of exposed insulation, exposed piping, and exposed ductwork not specified as work of DIVISION 9 - FINISHES, shall be work of this Division. Damaged surfaces of factory finished items shall be repaired to the satisfaction of the Architect/Engineer as the work of this Division. Nameplates shall be protected until painting has been accomplished. Protection shall be removed and nameplates cleaned prior to acceptance of equipment.

4. Door grilles and access doors provided under this Division and not specified for installation as work of other Divisions, shall be installed as work of this Division.

1.10 MANUFACTURER'S RECOMMENDATIONS

A. Equipment and materials provided under this Division of the specifications shall be installed according to manufacturer's recommendations. Each manufacturers' application and installation instructions shall be reviewed prior to ordering equipment or commencing with the work. If the drawings or specifications show or describe any deviations from the manufacturer's recommendations the Contractor shall request clarification, from the Architect/Engineer and provide as directed at no additional cost to the Owner .

1.11 GUARANTEE AND SERVICE

A. The equipment, materials and workmanship shall be guaranteed for one year after beneficial use of a particular system, beneficial occupancy of the building or final acceptance of entire project. Where specifically indicated extended warranties shall be provided. Beginning date of guarantee will be established only after written request is received by the Architect/Engineer from the Contractor, and agreed upon by the Architect/Engineer stating the date the systems were turned over to the Owner for beneficial use or occupancy.

B. During the one year period of guarantee, any defects in equipment, materials, or workmanship shall be promptly corrected without cost to the Owner. Mechanical and associated electrical equipment shall be serviced and adjusted without cost during the guarantee period. Servicing and adjusting shall include labor, material, parts, etc., required during the first year. It includes but is not limited to: oiling motors, adjusting belts, adding refrigerant, adjusting and calibrating controls, and repairing leaks.

1.12 INTERRUPTION OF SERVICES

A. Services in existing buildings are to be kept in operation during renovations, except when specific permission is given to do otherwise. Before any services are interrupted, arrangements shall be made with the Owner to do this work at a time most convenient to the Owner. This procedure may involve working at night, on Saturday or Sunday, or at a special time of the year, with the length of time of the interruption agreed upon in advance. Once any service is interrupted, work to restore the service shall be on a continuous basis unless temporary service is provided or approval is obtained from the Owner to do otherwise. Temporary services indicated or required shall be provided as work of this Division. Allowance shall be made in the bid for the cost of any overtime incurred. Provide valves, caps, plugs, flanges, piping, etc. as required so that the existing utility can be placed back into service with provisions for the utility to be extended without an additional shutdown. Provide additional drains and vents in new and existing piping systems to minimize required shutdowns. Draining and filling piping systems after shutdowns have been completed shall be work of this Division.

1.13 DEMOLITION

A. Demolition work shall conform to the applicable requirements of DIVISION 1 - GENERAL REQUIREMENTS. Routings indicated for existing mechanical systems are approximate. Field verify existing conditions prior to ordering equipment or materials and make field adjustments as required.

B. Existing plumbing fixtures, equipment, piping and/or ductwork not being re-used shall be disconnected and removed. Services serving the equipment being removed shall be removed back to the next piece of equipment which remains, or to the existing main or duct which remains, and shall be capped or plugged, unless otherwise noted on

the drawings. Refer to architectural and mechanical drawings and specifications for more detailed requirements.

C. Care shall be taken in the removal of plumbing fixtures, equipment, piping and/or ductwork which the Owner elects to retain. In the removal of existing plumbing fixtures, equipment, ductwork and/or piping, that portion of any system which remains shall continue to function as before.

1.14 EXISTING WORK

A. Exercise care in the installation of new work so as not to render any of the existing systems that are to remain inoperable. Should the installation of new plumbing fixtures, equipment, piping and/or ductwork require the temporary removal and reinstallation or modification and relocation of existing fixtures, equipment, piping and/or ductwork, the cost shall be included as work of this Division and no additional compensation will be allowed.

B. Where existing piping or duct systems are indicated to be re-used, it is not possible to guarantee that the existing systems are completely suitable to be re-used. Before the systems are placed into service, a thorough check shall be made of existing equipment, piping systems, ductwork, etc., that will not allow new or existing equipment, piping, or duct systems to operate properly and shall notify the Architect/Engineer of any deficiencies found. Submit a description of the proposed remedial work to correct any deficiencies along with a detailed cost estimate.

C. Provide piping adaptors (increaser/reducer) or duct transitions at point of each connection. Verify field conditions, dimensions and sizes of piping and ducts, etc., required for work of this Division to connect with existing work now in place. Any discrepancies between the Contract Documents and the existing conditions shall be referred to the Architect/Engineer prior to ordering materials or performing any work affected by these discrepancies.

D. When connecting to existing systems, field verify positions of supply and return piping before performing any work. The directional flow arrows and piping labels indicated on the drawings shall be confirmed before performing any work. Report any discrepancies to the Architect/Engineer before proceeding. [When connection to any existing system field verify the service of the existing system before performing any work.] [When connecting to existing drainage (sewer, storm drain, etc.) systems, field verify location, depth, size, slope, and direction of flow prior to performing any work.]

1.15 EXISTING EQUIPMENT AND MATERIALS

A. Mechanical equipment removed and not indicated to be re-used shall be stored in one location on the site. Any equipment or material which the Owner does not

designate to be retained shall become the property of the Contractor and shall be removed from the site by him.

1.16 SPECIAL CONDITIONS

A. No piping, ducts or other mechanical equipment foreign to electrical equipment shall pass through or above spaces dedicated to electrical panelboards, electrical distribution panels, electrical switchboards, and motor control centers. Work shall conform with NFPA 70. Working clearances and dedicated spaces at electrical equipment shall be maintained per NFPA 70. Coordinate with each trade.

PART 2 - PRODUCTS

2.1 MATERIALS AND WORKMANSHIP

A. Equipment and materials shall be new and shall be listed by Underwriters' Laboratories, Inc. (UL) or Factory Mutual (FM) in categories for which standards have been set by that agency. Methods of installation shall be in full accord with the latest and current engineering practices. Pressure vessels, as called for by respective codes, shall be ASME and National Board Commission stamped.

2.2 SUBSTITUTIONS

A. Names of manufacturers and catalog numbers indicated in the Contract Documents are to establish a standard as to design and quality. Other products similar in design and of equal quality may be used if submitted to the Architect/Engineer and found acceptable. Refer to General Conditions for additional information. When the Contractor elects to use an acceptable alternate manufacturers' equipment, the Contractor shall be responsible to coordinate the change with the trades affected. The Contractor shall also pay for any additional work required under this Division as well as any other Division if the alternate equipment is used. If required by Architect/Engineer because of substitutions, submit for review 1/4" scale working drawings of equipment areas with plan and section views.

2.3 SUBMITTALS

A. Within 30 days after award of the Contract, and before executing any work, submit for review six copies of descriptive equipment literature or shop drawings **in one complete indexed and bound submittal** for the following items:

Access Doors	Insulation
Magnetic Starters	Fire Protection Shop Drawings
Gas Distribution Valves	Fire Protection Equipment
Gas Pressure Regulators	HVAC Valves
Backflow Devices	HVAC Water Specialties

Refrigerant Specialties
Flexible Duct and Fittings
Gas Flue Systems
Vibration Isolators
Chillers
Boilers
HVAC Pumps
Filters

Split System Equipment
Fans and Accessories
Dampers
Air Distribution Devices
Water Treatment
HVAC Control System Drawings
HVAC Control System Components
Testing and Balancing Contractor

B. The same equipment manufacturer shall be provided for multiple items of similar equipment, regardless of capacities, on this project, unless prior written deviation is given by the Architect/Engineer. Submittals shall be identified with project name, equipment name and number as indicated on the drawings, and specification paragraph reference. Submittals shall be properly marked to show proposed model number and accessories being provided and shall have the Contractor's stamp certifying that he has reviewed the submittal and found it to be in accordance with the specifications and drawings. Where applicable, submissions shall include installation drawings and brochures showing locations, methods of anchoring, connections to work of others, wall conditions at each particular installation and special floor mounting conditions. Submittals which do not comply with the above will be returned without review, for resubmittal.

2.4 ACCESS DOORS

A. Doors in gypsum board or masonry construction shall be Karp type DSC-214M or Milcor style M-Standard, 16-gauge steel frame and 14-gauge steel door construction, continuous piano hinge and a zinc chromate prime coat. Doors in glazed or ceramic tile construction shall be same type as above except stainless steel construction. Doors in inaccessible acoustical tile ceilings, or walls with wall covering shall have 16-gauge steel frame and 18-gauge steel panel construction, recessed door for acoustical tile or gypsum board insert covered with matching wall covering, concealed hinge with a zinc chromate prime coat, and exposed edges painted white when installed in acoustical tile ceiling. Doors in fire rated partitions or ceilings (up to 1½ hour rating) shall carry the Underwriters' Laboratories "B" label. Doors required in types of construction not hereinbefore specified shall suit the type and style of material in which installed. Unless otherwise indicated doors shall have screw driver operated locks.

2.5 ENCLOSURES

A. Control equipment enclosures provided by the Contractor or provided as part of a packaged piece of equipment shall meet the following minimum standards unless specifically indicated otherwise. Where indicated on the drawings or in the specifications, flush mounted enclosures shall be provided.

B. Control equipment enclosures provided within the building shall be equivalent to or greater than NEMA 1 type construction. Control equipment enclosures provided outside of the building, a non-enclosed area of the building or in an accessible crawl space under a building shall be equivalent to or greater than NEMA 3R type construction with drain and breather. Control equipment enclosures provided within hazardous areas, controlling explosion-proof equipment shall be NEMA 7 or 9 type construction. Control equipment enclosures provided for cooling towers and associated equipment within 20'-0" of towers shall be NEMA 4X noncorrosive type construction.

2.6 FUSES

A. Provide fuses for all fused equipment provided under this Division. Fuses shall be size and type required by the equipment manufacturer.

2.7 MAGNETIC STARTERS

A. Provide combination type magnetic starters for three phase motors. Provide magnetic starters or contactors for single phase motors which start and stop as part of an automatic control sequence. Unless noted otherwise magnetic starters shall be across-the-line type rated per NEMA standards. Starters shall have under voltage protection when used with momentary-contact push button stations and shall have undervoltage release when used with maintained contact push button stations. Enclosures for starters shall be as hereinbefore specified. Starters in motor control centers shall be fully compatible with the motor control center. Provide two-speed starters for two-speed motors. Two-speed starters shall have timing relay for time delay between speed changes.

B. Starters shall be non-reversing type complete with integrally fused 120 volt control transformer, start-stop push button and pilot light or hand-off-auto switch and pilot light, where indicated, or as required for control. Two speed starters shall have hand-off-high-low selector switches and pilot lights. Starters for motors interlocked to run with other motors or which have automatic start-stop controls (exclusive of safety controls such as firestats, freezestats, etc.) shall have hand-off-auto switch. Starter shall be wired so as not to by-pass safety controls when in the "hand" position.

C. Starter contacts shall be of silver alloy, and shall be of the double break type. The movable magnet and contact assembly, an arc hood in which the fixed contacts are mounted, solenoid cell, and thermal overload relays (one in each phase) shall be assembled and mounted on a heavy steel back plate. The only moving part shall be the magnet and contact assembly which shall move up and down. Each pole shall be enclosed in an individual arc chamber.

D. Starters for 5 horsepower and larger 3-phase motors shall include under voltage/phase-reversal/phase-loss protection relay wired into the control circuit. Overload protective devices shall be selected in accordance with the motor nameplate, and shall be of the thermal inverse time limit type and shall include a manual reset type push button on

the outside of the cover. Overloads shall operate on the melting alloy principle. Starters shall have normally open and/or closed external electrical interlocks as required to suit equipment controlled. Magnetic starters shall include a disconnect switch with visible blades and Class R fuse rejection features. Acceptable manufacturers: Furnas Class 14, Square D Class 8536, GE Series 300 or approved equal.

2.8 MAGNETIC CONTACTORS

A. Magnetic contactors shall be Square D Series 8903-SMG70-V02 or equal, 30A, 3 pole, mechanically held, with 120 volt coil and non-fused disconnect.

2.9 MOTORS

A. Unless otherwise indicated, motors shall be NEMA Design B, constant speed, variable torque construction. Motors shall conform to the Energy Policy Act of 1992 and shall be of the premium efficiency type suitable for use with variable speed (variable frequency or voltage) motor drives. Electrical characteristics shall conform with the electrical supply as indicated on the electrical drawings.

B. Single-phase motors shall be split-phase or capacitor start type with built-in thermal overload. Three-phase motors shall be squirrel cage type.

C. Motors shall be guaranteed to operate continuously at full load with a 10% voltage variation above or below the specified voltage. Motors shall be rated for an ambient temperature of 40 degrees C and a temperature rise not to exceed 40 degrees C with a 1.15 service factor. Motors shall have either sleeve or pre-lubricated ball bearings as required for the particular application.

D. Motors shall be copper wound. Open drip-proof (ODP) motors shall have Class B insulation. Totally enclosed (TE) or totally enclosed fan cooled (TEFC) motors shall have Class F insulation. Motors shall be T-frame conforming to NEMA MG13 and tested in accordance with NEMA MG1 Part 12 and IEEE Test Procedure 112, Method B. Nameplate information shall include the manufacturer's nominal and guaranteed efficiency values.

E. Unless noted otherwise on the drawings or in the specifications, housings for motors in indoor locations shall be open drip proof (ODP) or explosion proof (XP) type. Motors in outdoor locations or subject to excessive moisture shall be totally enclosed (TE) or totally enclosed fan cooled (TEFC) type. Belt drive motors shall have bases with provisions for adjustment in field.

F. Motors provided on equipment not as an integral part of the equipment but propelling the equipment by the use of belts, sheaves, couplings, etc., shall be as manufactured by Emerson, General Electric, Marathon, U.S. Electric, or approved equal. Alternate manufacturers requesting approval shall submit evidence of a factory authorized

service facility within a reasonable distance of the project to service or replace motors under warranty. Motors manufactured by or specifically for equipment manufacturers and provided as an integral part of the equipment package need not comply with the requirements of this paragraph.

2.10 SAFETY PANS

A. Safety pans shall be fabricated from 18-gauge (min.) galvanized sheet steel. Sides of pans shall be a minimum of 2" high with top edges hemmed. Sides longer than 6'-0" shall have additional flat bar or angle top edge bracing to prevent sagging. Joints and seams shall be watertight. Pans shall extend at least 6" beyond the sides of the equipment it is serving. Provide a 1" steel female pipe coupling in side of pan near the bottom for overflow piping connection.

2.11 PREPARED OPENINGS

A. Piping and tubing installed through masonry or concrete walls, floor/ceiling assemblies, and floors above grade shall be installed through pipe sleeves.

B. Ducts installed through masonry or concrete walls and non-rated concrete floors above grade shall pass through 20-gauge galvanized sheet metal sleeves. Duct sleeve shall have a 1/2" maximum annular clearance around duct. Allowance shall be made for external duct wrap (if specified). Ducts, tubing and piping installed through floors of mechanical rooms shall have a 4" high concrete curb on each side to prevent water from leaking through openings. Exposed piping installed through walls shall be fitted with chromium plated escutcheons on each side of the wall. Exposed ductwork passing through non-rated masonry or concrete walls shall be fitted with a 2" wide sheet metal flange around each side of duct on each side of the wall.

C. Ducts installed through partitions, walls or floors which are smoke rated or have a fire rating of one hour or greater shall be installed in accordance with SMACNA standards. Piping and tubing installed through partitions, walls, or floors which are smoke rated or have a fire rating of one hour or greater shall be installed through pipe sleeves.

2.12 ROOF MOUNTED EQUIPMENT, DUCTS AND PIPING

A. Roof mounted equipment shall be installed on equipment supports or curbs as detailed on the drawings or as specified. Tops of curbs shall be level. Ducts penetrating the roof shall be installed within a waterproof curbed area as detailed on the drawings. Piping penetrating the roof shall be installed through a pitch pocket or piping curb as noted or detailed on the drawings. Any penetrations of the roof shall be watertight.

2.13 PIPE SLEEVES

A. Sleeves for tubing and piping installed through masonry or concrete walls shall be Schedule 40, galvanized steel pipe. Sleeves for tubing and piping installed through fire or smoke rated dry wall partitions, floors, and floor/ceiling assemblies above grade shall be a minimum of Schedule 10, galvanized steel pipe. Sleeves for tubing and piping installed through basement walls, and floors, and slabs below water level shall have a water stop flange welded to sleeve.

2.14 FIRE BARRIER MATERIAL

A. Fire barrier material shall be provided in annular spaces between sleeves and piping or tubing where piping or tubing penetrates floors or partitions that have a fire rating of one hour or greater. Material shall be UL classified as a through penetration fill, void or cavity material and shall be capable of passing a 4 hour fire test per ASTM E 814. Material shall be installed in strict accordance with the manufacturers instructions. Acceptable manufacturers: 3M Fire Barrier, Metacaulk, Nelson Fire Stop, PTI Fire Seal, Thomas & Betts Fire Safe, or approved equal.

2.15 SAFING MATERIAL

A. Safing material shall be installed in annular spaces between sleeve and pipe or tubing where sleeve and pipe or tubing penetrate partitions that are designated as smoke separations. Material shall be mineral wool designed for hand packing. Material shall have an ASTM E 84 rating of flame spread –10, fuel contributed –0, smoke developed –0 and shall be rated non-combustible per ASTM E 136. Acceptable manufacturers: Carborundum, U.S. Gypsum, or approved equal.

2.16 CURBS AND SUPPORTS

A. Prefabricated metal curbs and equipment support rails for equipment provided on built-up roofs, unless otherwise noted on the drawings, shall be provided under SECTION 15600 - HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS. Curbs and equipment supports for equipment installed on metal roofs shall be a product of the metal roof manufacturer. [Poured in place concrete curbs and supports shall be in accordance with DIVISION 3 - CONCRETE.] Interior and exterior supports such as, but not limited to pipe stands, elbow supports, strut channels, trapeze supports, structural steel supports and hanger rods shall be hot-dipped galvanized after fabrication.

2.17 SUPPORTS

A. Supports shall adequately support the weight of the pipe and material contained within. Supports shall be manufactured in accordance with MSS SP-58, ANSI B31.1 and UL 203. Acceptable manufacturers: Elcen Mfg. Co., Michigan Hanger Co., Anvil, Persing & Co., or approved equal. Supports for piping above grade shall be as follows:

B. Cast iron or steel piping:

1. Interior:

- a. Anvil Figure 260 adjustable clevis hanger and rod, carbon steel construction, zinc plated finish.
- b. Strut channels, supporting steel, and trapeze hangers, carbon steel with zinc plated finish.

2. Exterior (Crawl spaces and unenclosed areas):

- a. Anvil Figure 260 adjustable clevis hanger and rod, carbon steel construction, hot dipped galvanized finish.
- b. Strut channels, supporting steel, and trapeze hangers, carbon steel with hot dipped galvanized finish.

3. Copper tubing - Anvil Figure CT-69 adjustable tubing ring and rod, carbon steel ring with copper finish and malleable iron adjusting nut.

4. Riser clamps:

- a. Clamps, bolts and nuts for cast iron or steel piping shall be Anvil Figure 261, carbon steel construction, hot dipped galvanized finish.
- b. Clamps for copper tubing, glass or plastic piping shall be Anvil Figure 261c, black carbon steel construction, copper plated for copper tubing or with formed section plastic coated for glass or plastic piping.

C. Hangers for piping under concrete slabs on grade or fill - Waste and vent and domestic water piping shall be type 316 stainless steel rod. Hangers for any other piping shall be type 316 stainless steel clevis type hanger and rod with rod lapped over the slab reinforcing steel. See drawings for details.

2.18 UNIONS AND FLANGES

A. Unions:

- 1. Steel piping 2½" and smaller - Unions shall be ANSI B16.39 malleable iron, WOG, female pattern, threaded ends, brass seat, with ground joint.
- 2. Copper tubing 2½" and smaller - Cast copper unions shall have solder ends, with ground joint.

B. Flanges:

- 1. Steel piping 3" and larger - Welding neck or slip-on type, flat or raised face, forged steel, ASTM A 181, Grade I, ANSI B16.5, Class 150 or 300 as required. Bolts shall be ASTM A 307, Grade B8. Nuts shall be ASTM A 307, Grade 8. Exterior bolts and nuts shall be stainless steel.

2. Copper tubing 3" and larger - Flanges shall be ANSI Standard B16.24, Class 150, with solder joint ends. Bolts shall be ASTM A 307, Grade B8. Nuts shall be ASTM A 307, Grade 8. Exterior bolts and nuts shall be stainless steel.

3. Gaskets shall be 1/16" thick, similar to Garlock or Cranite, factory cut, one piece. Provide full-face gaskets for flat-face flanged joints, and ring gaskets for raised-face flanged joints.

2.19 DISSIMILAR METALS

A. 2" and smaller - Dielectrically isolated unions, couplings or nipples. 2 1/2" and larger dielectrically isolated and gasketed flanges.

2.20 PIPE IDENTIFICATION

A. Identification of piping shall be by the use of colored, waterproofed, all-temperature, self-adhering pipe markers and directional arrows. Acceptable manufacturers: Ready Mode, Seton Style RPM, MAPA Label Tabs, or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION OF VALVES

A. Valves shall be provided where indicated on the drawings or as hereinafter described. Valves shall be installed so that the handle is accessible and operable. Where required due to space limitations, special short style handles may be provided on ball valves. Gate, globe and other style valves having packing glands shall have valve handles installed in the horizontal or vertical (down) position or any angle between to keep packing glands moist.

B. Valves located in walls, chases and above suspended, inaccessible ceilings shall be provided with access doors. Valves located above accessible acoustical tile ceilings shall have the location of each valve marked with a pressure sensitive colored dot applied to the T-bar. Color to be selected by the Architect/Engineer. Valves located above ceilings indicated to be used for drains, or for future use shall have a pipe plug or nipple and cap closure. Valves in equipment spaces indicated to be used for drains, blowdowns, etc., shall have hose threads for extensions to floor drains. Hose bibbs shall not be used.

3.2 RECORD DRAWINGS

A. At the completion of the work, unless noted otherwise in the general conditions, mark-up one reproducible set with colored pencils in a neat and understandable manner to show significant changes made during construction. Provide an electronic copy of the drawings in .pdf format on a disc to be included in the closeout documents.

Underground piping, valves and cleanouts outside of the building shall be dimensioned on the record drawings. Dimensions shall indicate the location of exterior mains with reference to the exterior building walls and/or corners. Contractor shall pay for reproduction costs.

3.3 OPERATING INSTRUCTIONS

A. Prior to the time scheduled for occupancy, the Contractor shall provide the services of a competent mechanic to instruct the Owner in the care and operation of equipment. Before final acceptance, the Contractor shall prepare and deliver to the Architect/Engineer three bound copies of operating instructions, which shall be contained in hard back loose leaf type binders, divided into a suitable number of volumes so as to permit easy reference, and shall include:

1. Description of major components of systems, including the function of major items.
2. Detailed operating instructions and instructions for making routine minor adjustments.
3. Routine maintenance operations.
4. Manufacturer's catalog data, service instructions wiring diagrams, fabrication drawings and parts list for each piece of operating equipment.
5. Copies of equipment submittals and shop drawings, including review sheet, reviewed by and acceptable to the Architect/Engineer.
6. Guarantee and Warranty Information.
7. Names and telephone numbers of subcontractors and suppliers.

3.4 ELECTRICAL WORK

A. Refer to schedules and electrical drawings for motor voltages. Motors for mechanical equipment shall be provided under this Division. The work of this Division shall include setting and aligning integral drive motors in operating position. Unless noted otherwise, combination magnetic starters and, magnetic motor starters for mechanical equipment shall be provided under this Division and installed and electrically connected under DIVISION 16 - ELECTRICAL.

B. Electrical work in connection with DIVISION 15 - MECHANICAL required but not indicated as work of DIVISION 16 - ELECTRICAL shall be work of this Division. Control disconnects, monitoring, level, electrical interlock and signaling wiring and raceways shall be work of this Division. Safety, signaling, and control devices such as

thermostats, firestats, damper motors, valve operators, push buttons, pilot lights, control and/or monitoring panels, crank-case heaters, etc., shall be provided and wired under this Division in strict accordance with an approved wiring diagram. Wiring and raceways installed under this Division shall comply with the requirements of DIVISION 16 - ELECTRICAL and shall be installed by a licensed electrician.

3.5 CONCRETE

A. Formed and poured in place concrete work including equipment housekeeping pads, concrete equipment bases that are installed on vibration isolators, and piping supports not provided as work of other Divisions shall be provided as work of this Division and shall be standard weight concrete in accordance with the American Concrete Institute's Standard Specifications, and shall test at 3000 psi in 28 days.

B. Provide required templates and dimensioned drawings for housekeeping pads, supports, and anchor bolts. A 4" high (min.) reinforced concrete housekeeping pad shall be provided under each piece of exterior and interior floor supported mechanical equipment. Pads shall extend a minimum of 6" beyond edges of equipment. Edges of pads shall be chamfered.

3.6 EQUIPMENT SUPPORTS

A. Unless otherwise specified, supports necessary for properly supporting the work and the equipment of this Division shall be provided under this Division. Additionally, provide isolation materials to prevent transmission of vibration to the building structure. Isolation of equipment as shown on drawings or specified is the minimum required, and any additional isolation required to prevent transmission of vibrations shall be provided under this Division, in accordance with the equipment manufacturer's recommendations. Foundations for supports shall be provided under DIVISION 3 - CONCRETE or DIVISION 5 - METALS.

3.7 SAFETY PANS

A. Provide safety pans under water heaters, hot water storage tanks, fan coil units, air handling units, boilers, etc. Pipe safety pan outlet to floor drain, trapped waste, or to outside of building.

3.8 OPENINGS, GROUNDS AND CHASES

A. Openings, grounds, chases and lintels will be provided under other Divisions, as directed by this Division, to accommodate the piping, ductwork and equipment. Sleeves and prepared openings shall be accurately located in slabs or walls before pouring of concrete. It shall be the responsibility of this Division to verify that openings and chases are properly located. Openings associated with work of this Division not indicated or

specified in other Divisions, shall be work of this Division. Coordinate location of grease ducts through roof and arrange for roof framing to be relocated to avoid offsetting of ducts.

B. Holes through existing concrete shall be either core drilled or saw cut. Drilled or cut holes required shall have the approval of the Architect/Engineer prior to cutting or drilling. Sleeves set in openings cut in existing masonry or concrete walls or concrete slabs shall be one pipe size smaller in outside diameter than the cored hole. The sleeve shall be grouted in place with non-shrinking waterproof grout. Where piping is installed through smoke and/or fire separations, fill annular space between sleeve and piping with safing or fire barrier material.

3.9 ACCESS DOORS

A. Equipment which may require constant or periodic operation or adjustment such as but not limited to valves, water hammer arresters, cleanouts, automatic smoke and fire dampers, damper operators, mixing boxes, variable volume equipment, steam traps, plumbing traps, plumbing fixture connections, etc., located in or above inaccessible ceilings, walls, or chases shall have hinged metal access doors as required by type of construction.

B. Minimum door size shall be 8" x 8". Doors shall be of sufficient size to adequately service, repair, replace or inspect the equipment. Locations of access doors in ceilings shall be coordinated to avoid conflict with ceiling mounted devices (lighting fixtures, fire alarm devices, ceiling diffusers, sprinkler heads, etc.). Locations shall be approved by the Architect/Engineer.

3.10 PIPE SLEEVES

A. Piping and tubing installed through masonry or concrete walls, concrete floors above grade, exterior metal wall panels, and smoke or fire rated partitions shall be installed through pipe sleeves as hereinbefore specified.

B. Sleeves are not required for soil, waste, vent, storm drainage, fire protection, or domestic water piping through slabs on grade or fill. Any other piping shall be provided with sleeves. Sleeves shall be finished flush with both sides of wall. Sleeves through floors above grade shall project a minimum of 2" above finished floors. Sleeves through exterior metal wall panels shall be installed to prevent water from entering around perimeter of sleeve. Diameter of sleeves shall be large enough to provide a 1/4" minimum annular space between pipe and sleeve or insulation and sleeve. Annular space shall be large enough to accommodate pipe movement due to expansion or contraction.

C. Where piping or tubing is installed through fire or fire/smoke rated separations, the annular space between the piping or tubing and sleeve shall be filled with UL Classified fire barrier material. Where piping or tubing is installed through smoke rated separations, the annular space between the piping or tubing and sleeve shall be packed

solid with safin material. Annular space between pipe or tubing and sleeve installed through exterior walls shall be made waterproof by filling with a silicone type caulking compound on the exterior side only. Annular space between pipe and sleeve installed through basement walls, floors and slabs on grade or fill and slabs below water level shall be made waterproof by using a mechanically expandable seal, or an approved equal means.

3.11 SUPPORTS

A. Hangers, guides, brackets and braces shall be adequately fastened to the structure by means of concrete inserts, drilled expansion shields, drilled wedge type devices, bolts or beam clamps. Powder driven fasteners shall not be used. Inserts in slabs and beams for fastening work shall be cast in place in new slabs. Inserts required in existing concrete shall be drilled type. Drilling shall not penetrate the post-tensioning tendons.

B. Where building construction consists of a metal roof supported by metal purlins, provide additional steel members to span between roof supports to provide supports for hanger rods.

3.12 GENERAL PIPING INSTRUCTIONS

A. Exposed and concealed horizontal lines of pipe and tube shall be carried on hangers and supports hereinbefore specified and properly spaced to maintain alignment. Install pipe and tubing true to line and grade. Piping shall be concealed except where noted. Piping shall be installed above suspended ceilings and in furred partitions. Exposed piping shall be installed parallel to or at right angles with building walls, except where otherwise shown on drawings. Changes in elevation, to suit varying ceiling heights, shall be made so that piping will stay exposed. Exposed pipe through walls, floors and ceilings shall be fitted with chromium plated escutcheons securely held in position with allowance for expansion. Escutcheons shall be large enough to fit the pipe, tubing or insulation and to cover openings around the sleeves through walls. Minimum bury for exterior piping shall be 18" below finish grade, unless noted otherwise on drawings or in specifications. PVC water mains shall have 30" minimum cover.

B. Wherever changes in sizes of piping occur, changes shall be made with reducing fittings. The use of reducing couplings in rolled or cut groove joint piping or bushings in other piping systems will not be permitted.

C. Cutting and boring through structural members shall be done only when approved by and under supervision of the Architect/Engineer. Offsets in piping above slab shall be made with fittings. Bending of pipe shall not be permitted. Automatic valves or traps shall be provided with unions and shut-off valves so that they can be removed for servicing. Valving shall also be arranged so as to eliminate the necessity of draining major

parts or entire system while service or repairs are made. Drains where required by manufacturer and at each low point or trapped area of each system shall be provided.

3.13 CONNECTION OF COPPER TUBING

A. Copper tubing shall be cut with square ends, and burrs and fins removed. Tubing shall be handled and protected carefully and tubing cut, dented, or otherwise damaged shall be replaced. Ends of tubing and fittings shall be cleaned using sand or emery cloth.

B. Copper Water Tube: Apply a thin coat of flux to end of tube and solder cup. Insert tube into fitting full depth and apply heat. Apply solder until bead appears at end of fitting. Clean excess solder and flux from completed joint.

C. Copper Refrigerant Tube: Refrigerant piping shall be installed so proper oil drainage and entrainment are maintained. Materials used in the construction and installation of refrigerant piping system shall be suitable for the refrigerant used and no material shall be used that will deteriorate due to the chemical action of the refrigerant or the oil or the combination of both. Equipment and piping openings shall be plugged or capped to prevent air, dirt, or moisture from entering the system. Piping must be thoroughly cleaned before the system is charged with refrigerant. Suction lines shall be pitched no less than $\frac{1}{2}$ " per 10' toward the compressor. During the brazing process dry nitrogen shall be bled continuously through the piping.

3.14 CONNECTION OF SCREW JOINTED PIPING

A. Piping shall be square cut and free from fins, burrs, die marks, etc. Threads shall be full cut to depth of die. Apply approved lubricant or thread sealing tape on male threads only. Screw fitting and pipe together using pipe wrenches so that not more than three threads remain exposed on pipe. Clean excess joint material from completed joint. Joints in galvanized piping systems shall be cleaned and sprayed with two coats of zinc rich rust inhibiting paint.

3.15 CONNECTION OF WELDED JOINT PIPING

A. Welded joints shall conform to the requirements of ANSI B31.1. Welders shall be qualified using shielded metal arc welding process or other approved process in accordance with the applicable provisions of the ASME Boiler and Pressure Vessel Code, Section IX. Prior to erection, each length of pipe shall be held in an inclined position and repeatedly tapped to loosen any scale or foreign matter within the pipe. Each length of pipe shall be thoroughly swabbed prior to erection.

3.16 CONNECTION OF GROOVE JOINTED PIPING

A. Piping shall be inspected and verified free from indentations, projections, grooves, weld seams or roll marks on the exterior pipe surface over the entire gasket seating area to insure a leak-tight gasket seating. Pipe ends shall be square cut. Cut and roll grooves shall meet the manufacturer's criteria. Gasket, pipe ends and coupling housing shall be properly lubricated per manufacturer's recommendations prior to seating and aligning.

3.17 SUPPORTS AND CLAMPS

A. Vertical support and bracing for risers shall be by use of riser clamps at every floor but not less than 15'-0" o.c. Horizontal **piping above grade** and within buildings shall have supports and rods adequate for size, material and service, and be supported at not more than the following intervals on straight runs of piping:

MAXIMUM SUPPORT SPACING - CAST IRON PIPING

PIPE DIAMETER	SUPPORT SPACING	MIN. HANGER ROD-DIAMETER
2"	5'-0" and at each Joint	$\frac{3}{8}$ "
3"	5'-0" and at each Joint	$\frac{1}{2}$ "
4"-5"	5'-0" and at each Joint	$\frac{5}{8}$ "
6"-8"	5'-0" and at each Joint	$\frac{3}{4}$ "

MAXIMUM SUPPORT SPACING -STEEL AND COPPER PIPING

PIPE DIAMETER	SCREWED, SOLDERED & WELDED JOINTS	GROOVED JOINTS	MIN. HANGER ROD DIAMETER
$\frac{1}{2}$ " to $1\frac{1}{4}$ "	6'-6"	6'-6"	$\frac{3}{8}$ "
$1\frac{1}{2}$ " to 2"	10'-0"	7'-6"	$\frac{3}{8}$ "
$2\frac{1}{2}$ " to 3"	10'-0"	10'-0"	$\frac{1}{2}$ "

B. When interior support rods for pressurized piping are over 12" in length, provide lateral bracing every fourth hanger or as required to prevent swaying. Offsets or bends in hanger rods or pipe hanging from pipe are not acceptable. Piping shall be racked and handled in a manner to prevent entrance of dirt and foreign matter. Open pipe ends shall be plugged or capped during erection. Horizontal pipe shall be supported not over 1' from the fitting at each change in horizontal direction or vertical elevation of the piping. Pipes must be installed so that they may contract or expand freely without damage to other work or injury to themselves.

C. In securing rods and hangers to wood or metal, angle clips, beam clips or C-clamps shall be used. Angle clips must be attached to structure by means of screws or bolts. Securing rods to concrete shall be as hereinbefore specified. Trapeze supports with U-bolts, pipe straps or clamps may be used where two or more pipes run parallel at the same elevation. Perforated type strap hangers shall not be used. Exterior pipe supports shall be hot dipped galvanized after fabrication.

D. Vibrations or movement developing in piping shall be eliminated or isolated by re-spacing of supports, anchoring or installation of spring supports as directed. Refrigerant liquid piping shall be isolated by providing a 6" long piece of $\frac{3}{4}$ " thick elastomeric type insulation between pipe and hanger. Insulated piping with a normal operating range of 55 degrees or less, provide a 20-gauge sheet metal saddle approximately 12" long and having 180-degrees of contact with insulation between the hanger or support and the insulation for each pipe. Insulated piping with a normal operating range of 56 degrees or greater may have the hanger installed between the pipe and the insulation. Where individual pipe supports are installed outside of the insulation jacket or trapeze supports are used to support insulated pipes, a galvanized sheet metal saddle, as described above, shall be installed between the support and the insulation.

3.18 UNIONS OR FLANGES

A. Unions or flanges shall be provided at items of equipment to facilitate their easy maintenance, including tube bundle or coil removal, and/or cleaning. It shall not be necessary to remove any valve, strainer, or device to do the required maintenance. Piping connections at equipment shall be in accordance with the current engineering and installation practices. The requirements of this paragraph will be strictly enforced and if in the opinion of the Architect/Engineer it is not adhered to, the Contractor will be required to re-pipe the equipment as directed.

3.19 WORK RELATED TO EQUIPMENT NOT FURNISHED AS WORK OF THIS DIVISION

A. Unless specifically indicated otherwise, any required mechanical services for and required mechanical connections to items indicated on the drawings or in the specifications or items provided by the Owner shall be mechanically connected as work of this Division. The Contractor shall provide piping, valves, traps, etc., as required for complete operation of each piece of equipment.

3.20 DISSIMILAR METALS

A. Inert NSF/FDA lined dielectric nipples shall be provided between copper, bronze or brass piping material or valves and steel piping material or steel tanks. Dielectric nipples and brass or copper unions or flanges shall be provided at cast iron valves and equipment where hereinbefore specified for equipment maintenance. Dissimilar metals

shall be isolated from surface contact with each other by the use of a non-conductive material, tape, etc.

3.21 PROTECTION OF WORK

A. The Contractor shall protect equipment, fixtures, and work from damage. Damaged work will be rejected and replaced at the expense of the Contractor. Where possible, rooms containing new plumbing fixtures shall be kept locked until the building is turned over to the Owner. Immediately after installation of each plumbing fixture, it shall be covered with a fixture protector.

B. Mechanical equipment shall be protected from damage and from the weather. Provide adequate and proper storage facilities for items during the progress of the work.

3.22 CLEANING OF EQUIPMENT AND MATERIAL

A. Prior to acceptance, the Contractor shall clean equipment and remove grease, dirt and foreign matter. Pressure regulating assemblies, traps, strainers, flush valves and similar items shall be thoroughly cleaned. Air, oil and natural gas piping shall be blown out with clean compressed air. When connections are made to existing systems, the Contractor shall do cleaning and purging of the existing systems required to restore them to the condition existing prior to the start of work.

3.23 FRICTION LOSSES, ELECTRICAL RATINGS AND SPACE REQUIREMENTS

A. The values of air and water friction losses, electrical current ratings and space requirements for various pieces of equipment, as contained in these specifications or as scheduled, are estimated values and sizes and have been used in obtaining specifications for equipment and for sizing ducts, pipe, electric wiring and motor controls. Any necessary changes in any of these items resulting from values other than the estimated ones shown shall be the responsibility of the Contractor and shall be subject to the approval of the Architect/Engineer. The Contractor shall pay any costs for additional labor and material required including costs of any other Contractor involved. Should substitute equipment require different requirements from that shown on the drawings, the Contractor shall be responsible for the cost of the changes. Any such changes must be approved by the Architect/Engineer.

3.24 MARKING OF EQUIPMENT

A. Each piece of mechanical equipment shall be suitably identified by means of ¼" high letters cut in white laminated phenolic strip to show black letters. Mechanical equipment, such as but not limited to, boilers, air handling units, exhaust fans, starters, etc., shall be labeled. Strip shall be secured to interior equipment using self-adhesive backing and to exterior equipment by means of two brass bolts and nuts or screws.

3.25 IDENTIFICATION OF PIPING

A. Piping, whether insulated or not shall be identified. Identification may be omitted from piping in inaccessible chases and furring and where use is obvious, due to its connection to fixtures or equipment and where the appearance would be objectionable, as in finished rooms.

B. Identification shall be placed as follows - near each valve and branch connection, above accessible ceilings wherever piping emerges or disappears from view when viewed from the floor of the room in which it is installed, labels shall not be more than 10' apart.

3.26 CHANGES TO PIPING OR DUCTS

A. Should the Contractor desire to make changes in the routing or arrangement of piping or ducts, whether for his own convenience, to avoid conflict with the work of other trades, or to conform to local codes, such changes shall not be made without the prior approval of the Architect/Engineer.

3.27 STARTING AND TESTING

A. A competent and experienced service and installation mechanic shall be employed by the Contractor to start test and adjust the equipment. The Architect/Engineer reserves the right to require the test of any item of equipment or machinery. Such tests shall be conducted by the Contractor in the presence of the Architect/Engineer.

3.28 PROJECT CLOSEOUT DOCUMENTS

A. Prior to the final acceptance of the project the Contractor shall deliver to the Architect/Engineer for review, the following in two three-ring binders:

1. Certificates of approval from local regulatory agencies.
2. Extended equipment warranties.
3. Operating instruction manuals which shall include copies of reviewed submittals and shop drawings including review sheet.
4. Performance tests of backflow preventer.
5. NFPA 13, 14, and 2001 acceptance certificates for the sprinkler system, standpipe system, and fire suppression systems.
6. Copy of reviewed sprinkler, standpipe, and gaseous suppression system shop drawings.

7. Signed receipt showing that the hydronic temperature/pressure test kit has been delivered to the Owner.

8. HVAC test and balance reports.

9. Record drawings.

B. Final payment will be withheld until each applicable item has been provided to and is found satisfactory by the Architect/Engineer.

- END OF SECTION -

SECTION 211000 - FIRE PROTECTION SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

A. The work under this Section includes the modifications to the existing wet pipe automatic sprinkler system in accordance with NFPA 13.

B. The wet pipe sprinkler system shall be provided with the required components to provide a complete and working system which shall include but shall not be limited to: sprinkler heads and piping.

C. The system shall include items specified or necessary for a complete and operating system.

D. Perform standard annual inspection on system being modified prior to modifying system. Furnish Architect a report indicating system is in compliance or a detailed report listing system deficiencies which are outside the scope of work for this project.

1.2 CONTRACTOR QUALIFICATIONS

The modifications to the fire protection system shall be by a licensed Fire Protection Contractor, certified by the State of Louisiana, regularly engaged in the installation of fire protection systems and equipment.

1.3 SUBMITTALS

A. The Contractor shall prepare equipment brochures, hydraulic calculations, and shop drawings for the work of this contract, as required by the State Fire Marshal.

B. Equipment brochures shall consist of items specified hereinafter and items that are pertinent to the work.

C. Hydraulic calculations shall be computer generated in an acceptable NFPA format.

D. Shop drawings shall show the arrangement of piping, equipment and details necessary to install the work.

E. The Contractor shall submit the following to the Architect for review:

1. Six sets of equipment brochures.
2. Six sets of hydraulic calculations.

3. Three sets of shop drawings and one set of reproducibles.
4. Completed Louisiana State Fire Marshal's plan review form.
5. Check for review fee, if applicable.

F. The hydraulic calculations and shop drawings shall be prepared by and certified by a NICET Level III designer or a registered Louisiana mechanical engineer.

G. In the event additional clarifying details and/or components are required by the inspecting authorities, the Contractor shall prepare the details, secure approval and provide components at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 PIPING

A. Wet Pipe sprinkler system piping inside buildings:

1. Piping 2" and smaller - ERW black carbon steel pipe, Schedule 40, ASTM A 795, fittings shall be threaded black cast iron, 125 psi, ANSI B16.4; joints shall be threaded.
2. Piping 2½" and larger - ERW black carbon steel pipe, Schedule 40, ASTM A 735; fittings shall be grooved type malleable iron, 500 psi rating, ASTM A 47, listed by UL and/or FM; joints shall be cut grooved type.

B. Flanges:

1. Where indicated on the drawings or required by products hereinafter specified, flanges shall be installed.
2. Flanges shall be carbon steel, ASTM A 181, Grade 1, 150 psi, ANSI B16.5.
3. When installed on piping required to be galvanized, flanges shall also be galvanized.

C. Flanged fittings:

1. Where indicated on the drawings or required by products hereinafter specified, flanged fittings shall be installed.
2. Fitting shall be black cast iron, short body, Class 250, ANSI A21.10.

2.2 JOINTS

A. Flanged joints shall be in accordance with ANSI B16.1. Gaskets shall be full face of 1/8" minimum thickness red rubber. Flange bolts inside building shall be hexagon head machine bolts with heavy hexagon nuts, cadmium plated, in accordance with ANSI B18.2. Bolts and nuts outside buildings, in pits or installed underground shall be stainless steel.

B. Grooved joints shall be UL listed and FM approved. Gasket material shall be butyl rubber. Coupling shall be secured using track head cadmium plated bolts and nuts. Grooves shall be cut or rolled type for Schedule 40 pipe and rolled type only for Schedule 10 piping. Grooves shall be compatible with coupling used.

C. Welded joints shall be in accordance with ANSI B31.1.0, ANSI B31.1.0a, and ANSI B31.1.0b.

D. Screwed joints shall be in accordance with ANSI B2.1.

2.3 INSPECTOR'S TEST AND DRAIN

A. Valve shall be ball type, bronze body, 300 psi rated; glass impregnated Teflon seat; screwed ends, with sight glass; pressure gauge; bypass piping and relief valve if required.

B. Acceptable manufacturers: AFG Manufacturing Co., or approved equal.

2.4 SPRINKLER HEADS

A. Heads installed in areas without ceilings shall be upright type with bronze finish. Heads in areas with suspended ceilings shall be flush type with white cover plate.

B. Heads shall be rated at 165, 212, and/or 286 degrees Fahrenheit as required to suit the hazard protected. Connections shall be 1/2 or 3/4 inch, male threads, ANSI B2.1, with 1/2 and/or 17/32 inch orifice.

C. Heads shall be tested and listed by UL and/or FM. Sprinklers shall be the product of the manufacturer represented by the successful sprinkler Contractor.

2.5 SPARE HEAD BOX

Provide in a conspicuous place near the main riser valve, an enameled steel box housing 12 spare heads and a sprinkler wrench. Style and rating of heads shall be in proportion to the style and ratings of the heads installed.

2.6 IDENTIFICATION SIGNS

Drains, etc., required to have signs by NFPA 13 shall have standard identification signs. Signs shall be painted fire red with white lettering and shall be attached in a conspicuous position.

PART 3 - EXECUTION

3.1 TESTS AND ACCEPTANCE

A. The fire protection system shall be tested under hydrostatic pressure not exceeding 200 psi for a duration of not less than two hours.

B. Piping subjected to the hydrostatic test shall be filled with water and thoroughly checked for the elimination of air. The control valves for existing risers and mains shall be closed during the pressure testing of the new system. Joints shall be proven tight by the test. Defective work or materials shall be corrected or replaced in an approved manner. If necessary, piping shall be dismantled and reassembled with the use of new pipe or fittings. No caulking or makeshift method of temporary repair of defective work will be permitted. Tests shall be repeated until the particular line or system receives the approval of the representative of the Architect.

C. Final acceptance of the fire protection work will not be granted until the system is inspected and accepted by a representative of the State Fire Marshal.

3.2 WATER DAMAGE

The fire protection Contractor shall be responsible for any damage to the work of others, to the building, property and materials of others caused by leaks in the fire protection system caused during the installation and/or testing of the fire protection system. The fire protection Contractor shall pay for the replacement or repair of any work or items so damaged.

3.3 SPRINKLER HEADS

A. Sprinkler heads shall be provided to provide complete building coverage per NFPA 13. Sprinkler heads shall be centered in ceiling tiles.

3.4 HYDRAULIC CALCULATIONS

A. The hydraulic calculations shall be based on the fire protection system described in paragraph 1.1.A SCOPE. Prepare hydraulic calculations for the design of the system and submit them to the Architect for review.

B. Hydraulic calculations shall be prepared in accordance with NFPA 13 formats.

C. Prior to designing the system, conduct a flow test to determine the current gpm, static and residual pressures available in the public water mains at the site. The designer shall allow a **10% residual pressure safety factor** in compiling the hydraulic calculations.

3.5 SPRINKLER SYSTEMS

A. The sprinkler systems shall be hydraulically designed as follows:

1. Wet Pipe Systems:

a. Light hazard areas shall be calculated for 0.10 gpm/sf over the most remote 1500 sf with a combined hose allowance of 100 gpm.

b. Ordinary hazard, group 1 areas shall be calculated for 0.15 gpm/sf over the most remote 1500 sf with a combined hose allowance of 250 gpm.

3.6 PIPE SUPPORTS

A. Piping shall be supported by means of hangers tested and listed by UL and/or FM. Sizing, spacing and installation shall be in accordance with NFPA 13.

B. Bolts and threaded rods shall have double nuts and washers or single nut, washer and lock washer.

C. Starting length, end length, and alternate lengths of main piping with grooved joint couplings shall be provided with two supports.

3.7 FLUSHING

A. Before performing pressure tests, the interior mains shall be thoroughly flushed by flowing water through each of the mains for five minutes. The Contractor shall provide temporary piping or hoses as required.

3.8 SPRINKLER SYSTEM OPERATION

A. Wet Pipe System:

When sprinkler heads have been fused, water from the piping system flows from the fused heads. This flow of water opens the check valve clapper and water flows to the system. To sound an alarm, water flowing in the riser or main activates the flow switch. Verify flow and valve supervisory switches are in working order. Replace if necessary.

- END OF SECTION -

SECTION 230500 - HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

A. Work under this Section shall include providing complete and functioning Heating, Ventilating and Air Conditioning (HVAC) systems for the project and appurtenances indicated or necessary.

B. Items specified or required shall be provided for a complete and operating system as described in SECTION 15010 - MECHANICAL GENERAL PROVISIONS.

1.2 ELECTRICAL WORK

Electrical work in connection with work of this Section not indicated under work of DIVISION 16 - ELECTRICAL, including disconnect switches for control wiring, shall be work of this Section.

PART 2 - PRODUCTS

2.1 VALVES

A. Valves shall be as listed below unless otherwise noted on the drawings:

1. Shut-off Valves (Chilled and Hot Water):

a. 3" and smaller - Watts Series B-6081, Nibco Series S-545, full port ball valve, 400 psi ASTM B 124 - brass body, ASTM B 16 brass ball and blowout proof stem; PTFE seats, packing and gaskets; sweat ends; two piece construction with lever handles.

Acceptable manufacturers: Conbraco, Hammond, Milwaukee, Nibco, Red-White, Watts, or approved equal.

b. 4" and 5" - Hammond Series #6211-01, Metraflex Series BW-2, or Nibco Series LD-2000-3 butterfly valve; 200 psi ASTM A 126 or A 536 iron lug style body with aluminum bronze disc, ASTM B 148; EPT liner; for ANSI standard 150 psi flanges; with locking lever handle.

Acceptable manufacturers: Centerline, DeZurik, Hammond, Metraflex, Nibco, or approved equal.

c. 6" and larger - Hammond Series #6211-03, Metraflex Series BW-4, or Nibco Series LD-2000-5, 200 psi ASTM A 126 or 536 iron lug style

body and aluminum bronze disc; ASTM B 148; EPT liner; for ANSI standard 150 psi flanges; with gear operator.

Acceptable manufacturers: Centerline, DeZurik, Hammond, Metraflex, Nibco, or approved equal.

2. Throttling Valves (Chilled and Hot Water):

a. 3" and smaller - Watts Series B-6081-BS, or Nibco Series S-545 fall port ball valve; 400 psi ASTM B 124 brass body, ASTM B 16 brass ball and blowout proof stem; PTFE seats, packing and gaskets; solder ends; memory stop plate; two piece construction with lever handle.

Acceptable manufacturers: Conbraco, Hammond, Milwaukee, Nibco, Red-White, Watts, or approved equal.

b. 4" and larger - DeZurik #499, 175 psi plug valve; cast iron body; electroless nickel plated cast iron plug with resilient insert; bronze bearings; #487 adjustable memory stop and drip cap; screwed or flanged ends for ANSI standard 150 psi flanges.

Acceptable manufacturers: DeZurik, Milliken, or approved equal.

3. Check Valves (Chilled and Hot Water):

a. 2½" and smaller - Nibco Series S-413, or Hammond Series IB912 or Jenkins #92-A, 150 psi swing check; ASTM B 62, bronze body and disc holder; composition type removable disc; soldered ends.

Acceptable manufacturers: Crane, Jenkins, Milwaukee, Nibco, Red-White, or approved equal.

b. 3" and larger - Jenkins #624, Hammond IR-1124, or Nibco Series F-918, 125 psi swing check; ASTM A 126, iron body with ASTM B 62 bronze disc and seat ring; flanged ends for ANSI standard 150 psi flanges.

Acceptable manufacturers: Crane, Hammond, Jenkins, Milwaukee, Nibco, Red-White, or approved equal.

c. At the Contractor's option, he may provide for 2½" and larger check valves above grade, Nibco #F-910 or Metraflex #900, 125 psi flanged, globe style check valve; ASTM A 48, Class 35 cast iron body with ASTM B 584 bronze seat and disc; flanged ends for ANSI standard 125 psi flanges.

4. Grooved Type Valves:

a. Valves provided for use with an approved grooved-piping system may be a product of the approved piping system manufacturer. Valve type, style, etc., shall be as hereinbefore specified for valve use.

B. Ball or butterfly valves installed in insulated piping systems shall have factory-furnished stem extensions suitable for thickness of insulation installed.

C. Each type of valve provided for the project (ball valves, butterfly valves, etc.) shall be of the same style and manufacturer, unless prior written deviation is granted.

2.2 STRAINERS

A. Strainers shall be as listed below unless otherwise noted on the drawings:

1. Y-type (Chilled and Hot Water):

a. 2" and smaller - Muesso #351 or Metraflex #BS-Y solder or screw joint strainer, 150 psi ASTM B 62 bronze body; screw type blow-off and strainer removal.

b. 2½" and larger - Muesso #751 or Metraflex #TF flanged-end strainer; 125 psi ASTM A 126, Grade B, cast iron body; bolted strainer removal and tapped blowoff; for ANSI standard 125 psi flanges.

c. Strainer baskets shall be stainless steel construction and shall have perforations as follows:

2" and smaller	-	0.033" (1/32").
2 1/2" to 4"	-	0.057" (1/16").
5" and larger	-	0.125" (1/8").

B. Strainer blow-offs shall be provided with shut-off valves, as specified for type of service, and garden hose thread adapter.

2.3 PIPING

A. Piping shall be as listed below unless otherwise noted on the drawings:

1. Chilled and Hot water piping and fittings above grade:

a. 2½" and smaller - Seamless copper water tube, ASTM B 88 Type L, hard-drawn; wrought copper solder-joint fittings, ANSI B16.22; joints shall be silver soldered or brazed, AWS A5.8. **All nipples and fittings ¾" diameter and smaller shall be threaded brass.**

b. 3" and larger -

1) ERW black carbon steel pipe, schedule 40, ASTM A 53, Grade B; fittings shall be standard black carbon steel, ASTM A 234; joints shall be welded.

2) ERW black carbon steel pipe, schedule 40, ASTM A 53, Grade B; mechanically cut or rolled grooved; fittings shall be fabricated of malleable iron, ASTM A 47, or ductile iron, ASTM A 536 castings. Where required fitting pattern is not available factory-constructed, standard wall, seamless type welding fittings with cut or rolled grooved ends may be used. Couplings shall be fabricated of ductile or malleable iron castings in two or more parts. Coupling gasket shall be molded synthetic rubber, per ASTM D 2000. Coupling bolts shall be cadmium plated, oval-neck, track-head, heat treated carbon steel type, with hexagonal, heavy nuts per ASTM A 183. Provide required adapters, nipples, flanges, etc., as required to connect to valves specified.

Acceptable manufacturers: Grinnell, Gustin-Bacon, Victaulic, or approved equal.

2. Condensate drain piping and fittings:

a. 1" and smaller - Seamless copper water tube, ASTM B 88, Type L, hard-drawn; wrought copper solder-joint fittings, ANSI B16.22; joints shall be soldered using 95-5, ASTM B 32, Grade 95A solder.

b. 1¼" and larger - Seamless copper drainage tube, ASTM B 306, Type DWV; cast bronze solder-joint fittings, ANSI B16.23; joints shall be soldered using 95-5, ASTM B 32, Grade 95A solder.

2.4 SPECIALTIES

A. Water:

1. Compression Tanks:

a. Each tank shall have capacity as indicated on the drawings and shall be constructed in accordance with ASME Section VIII Boiler Code. Tank shall be stamped for 125 psi design and shall bear a National Board Certification.

b. Construction shall be of carbon steel and shall have gauge-glass, drain and inlet tapings. Shell shall be finished with rustproof primer for field painting. Chilled water system tank shall be insulated as specified under INSULATION.

Acceptable manufacturers: Bell & Gossett, Taco, Armstrong Thrush, or approved equal.

2. Flow-balancing devices:

a. 2½" and smaller: Bell & Gossett Series CB. Bronze or cast iron construction with bronze disc and integral adjustable calibrated balancing valve with readout connections for differential-pressure meter rated 200 psi at 400 °F. Balancing valve shall have an indexing pointer and calibrated nameplate to indicate degree of valve closure. Readout connections shall have integral EPT check valves. Flow balancing device shall be sized for a pressure drop at design flow of not less than 1 psi and not more than 5 psi in the fully open position. Provide increasers/decreasers as required to suit line size.

b. 3" to 6": Bell & Gossett series CB cast iron construction with Class 125 flanges. Valves shall be fitted with a bronze seat, replaceable bronze disc with EPDM seal insert, and stainless steel stem. Valve shall have memory stop feature and calibrated nameplate with pointer indicating valve position. Valves shall be rated 175 psi at 250 °F and shall close leak-tight at full rated working pressure.

3. Temperature and Pressure test plugs (Chilled and Hot water systems):

a. Each test plug shall be of solid brass construction suitable for 1000 psig and 275° F. Plug shall have ¼" or ½" NPT threads for installing into standard coupling or fitting. An EPT self-sealing valve core with removable brass cap shall be capable of receiving a 1/8" diameter thermometer or pressure-gauge stem. Fitting and cap shall be extended above insulation.

b. The Contractor shall provide the User Agency, prior to acceptance of the project one pressure/temperature test kit consisting of carrying case, one 1½" test gauge, one gauge adapter and two 1" thermometers.

4. Thermometers and Wells:

a. Bimetal type - Each thermometer not provided as part of packaged equipment shall be liquid-filled rigid or angle style and have a stainless steel case, bezel, fittings and stem. Scale plate shall be of white aluminum with permanent black figures and graduations. Head assembly shall be sealed within a glass window. Bimetal element shall be a silicone coated low-mass helix carefully sized and aged, encased within the thermometer stem. Scale size shall be 5" diameter; stem length shall be 2½". Temperature ranges shall be as follows:

- (1) Chilled water systems - 0 to 150° F.
- (2) Condenser water system - 0 to 150° F.
- (3) Hot water systems - 20 to 240° F.
- (4) Glycol Systems - 0 to 150° F.

b. For each thermometer provide a separable well of brass construction, lagging extension type, for use in insulated piping systems.

c. Acceptable manufacturers: Palmer, Weksler #AF02, or approved equal.

5. Gauges:

a. Each gauge not provided as a part of packaged equipment shall have a 4½" dial diameter, aluminum flangeless case, phosphor bronze bourdon tube, bronze and stainless steel movement; ¼" NPT forged brass socket and tip; accuracy shall be 1 percent of scale range.

b. Gauge scales shall be selected so that the normal operating pressure falls approximately in the middle of the scale selected.

c. Each gauge shall be installed on a tee handle cock, solid brass construction. Gauges shall have a pressure rating to suit the system design pressure, but shall have a minimum rating of not less than 125 psi.

d. Acceptable manufacturers: Marshaltown Model #175P, U.S. Gauge, Weksler #BA14-I, or approved equal.

6. Hydronic Indication System (Trumpet Valve):

a. Where indicated on the drawings install a hydronic indication system to allow up to 4 pressure points to be read from one gauge.

b. Each manifold valve shall utilize spring return pushbutton of brass construction with ports for connection to system and a gauge calibration test port. Valve shall be provided with a pipe mounting bracket.

c. Each valve shall have gauge meeting ASA Grade A specifications, 1 percent accuracy. Case shall be 4½" diameter, stem mounted, steel construction with unbreakable lens. Gauge shall have recalibrator, compound scale reading in pounds and feet (0–100 psi; 0–232 ft.); vacuum range (0 to –14.7 lbs; 0 to –34 ft.) and quick-set dial for pressure comparison.

7. Flexible Connectors:

a. 2" and smaller - Metraflex Model BBS with corrugated bronze inner hose and bronze outer braid with solder-joint copper tube ends; or approved equal. Rated working pressure 165 psi at 250 F.

b. 2½" & Larger - Metraflex Metrasphere, or equal, spherical elastomeric flexible pump connector rated for 190 psi working pressure at 200 F. Provide with tie rod type control units to limit elongation and compression. Provide with Class 150 end flanges. Provide Metraflex Vaneflex connector with internal carbon steel flow straightening vanes for connectors installed on pump discharge piping.

8. Suction Diffusers (Single Suction Pumps):

a. Provide for each pump a suction diffuser sized to match the inlet of the pump provided.

b. Each suction diffuser shall consist of an angle-type, cast iron body with inlet vanes and a combination diffuser-strainer cylinder. An adjustable foot shall be provided to carry the weight of the unit.

c. The cylinder shall be equipped with a disposable fine mesh start-up strainer and a run strainer. Cylinder shall be designed to withstand a pressure-differential equal to the pump shut-off head of the pump provided and shall have a free area equal to five times the cross-sectional area of the pump suction opening.

d. Vane length shall be not less than 2½" times the pump suction diameter.

e. Inlet and outlet connections shall be equipped with ¼" gauge tappings.

9. Air Separator:

a. Air Separator (Chilled and Hot Water Systems). Each separator shall be of cast iron construction up to 2½" in size and welded steel construction in 3" and larger sizes. Construction shall be in accordance with ASME Section VIII Boiler Code for 125 psig and carry the ASME and National Board certification. Tangential inlet and outlet connections shall be NPT up to 3" size and flanged for sizes 4" and larger. Internal collector tube shall be perforated, stainless steel.

b. Acceptable manufacturers: Armstrong #VAS, Bell & Gossett #R, Taco, or approved equal.

10. Air Control Products:

a. Any other air control products such as, but not limited to, the following:

- 1) Compression tank and air charger tank drain;
- 2) Boiler air release fitting;
- 3) Manual air vents;
- 4) Automatic air vents, brass or bronze body, stainless steel float.

11. Pressure Reducing/Relief Valve

a. Provide, where indicated on the drawings, a combination (dual unit) pressure reducing (fill) valve, and non-code pressure relief valve both of which shall be equipped with an EPDM diaphragm to facilitate operation of the valves and to protect non-wetted components from the system fluid. The pressure reducing valve shall also have a brass inlet strainer and integral low inlet pressure check valve.

b. Both valves shall be of brass construction and shall have an adjustable pressure range.

12. Relief Valves:

a. Each valve shall be constructed of brass or iron bodies as required by piping system.

b. Internal working parts shall be constructed of brass, stainless steel or special rubber compound. Actuation shall be by rise-in-pressure or by manual external lever.

c. Valves shall be rated and sized for capacities, temperatures and pressures indicated on the drawings or as scheduled.

13. Pressure Reducing Valves (Fluids):

a. Body construction of each valve shall be of brass or cast iron as required by piping system. Valves shall be equipped with low inlet-pressure check valve and inlet strainer. Reduced-pressure setting shall be factory set but shall be easily externally adjustable.

b. Wetted parts shall be of noncorrosive construction (Buna-S, rubber, stainless steel or brass). Strainer, valve seat and stem shall be removable for service.

2.5 INSULATION

A. Insulation shall have a vapor-barrier jacket or facing complying with NFPA-90A fire and smoke hazard rating as determined by Underwriters Laboratories procedure UL 723, ASTM E 84 and NFPA 255 not to exceed a flame-spread of 25 and smoke-developed of 50. Maximum permeability of jacket shall be 0.02 per ASTM E 96.

B. Accessories such as adhesives, mastics, cements, tapes, etc., shall have the same fire and smoke hazard rating as jacket or facing.

C. Piping Systems:

1. Unless otherwise noted, piping installed inside the building shall be insulated with preformed split-type insulation. Insulation type and thickness shall be in accordance with the following table:

Inside the Building			
Service	Pipe Size	Insulation Type	Insulation Thickness (inches)
Chilled Water	1 1/2" and smaller	Fiberglass	1 1/2"
Chilled Water	2" through 6"	Cellular Glass	2"
Hot Water	3" and smaller	Fiberglass	1 1/2"
Hot Water	4" and larger	Fiberglass	2"
Refrigerant Suction and Hot Gas	2 1/2" and smaller	Fiberglass or Closed Cellular	1 1/2" Fiberglass or 3/4" Closed Cellular
Condensate Drain	All	Closed Cellular	1/2"

2. Piping installed outside the building and above grade shall be insulated with fiberglass split type pipe insulation in accordance with the following table:

Outside the Building and Above Grade			
Service	Pipe Size	Insulation Type	Insulation Thickness (inches)
Chilled Water	6" and smaller	Cellular Glass	2"
Chilled Water	8" and larger	Cellular Glass	3"
Hot Water	3" and smaller	Fiberglass	2"
Hot Water	4" and larger	Fiberglass	2 1/2"
Refrigerant Suction and Hot Gas	2 1/2" and smaller	Closed Cellular	1" Closed Cellular
Condensate Drain	All	Closed Cellular	1/2"

3. Fiberglass Piping Insulation - Pre-formed split-type fiberglass insulation, nominal 3-pound per cubic foot density, white all service jacket, and with thermal conductivity (k factor) of 0.23 at mean temperature of 70° F. Insulate fittings, flanges and valves with factory molded or field mitered sections joined with adhesive and wired in place. Provide vapor seal at fittings with a layer of glass fitting tape embedded between two 1/16" coats of vapor retarder mastic. Fitting tape shall extend over the adjacent pipe insulation and overlap on itself at least 2".

4. Cellular Glass Piping Insulation - Preformed split-type cellular glass piping insulation, nominal 7.5 pound per cubic foot density, white all service jacket, and with thermal conductivity (k factor) of 0.29 at mean temperature of 75° F. Apply joint sealant at all joints. Insulate fittings, flanges and valves with factory molded sections joined with adhesive and secured with metal bands. Provide vapor seal with vapor retarder or weather barrier reinforced mastic. Insulation shall be Foamglas by Pittsburg Corning, or approved equal.

5. Closed Cellular - Foamed tubular elastomeric insulation. Insulation shall meet the requirements of ASTM C 534, have a flame spread rating of 25 or less and a smoke developed rating of 50 or less per ASTM E 84. Miter fit insulation at fittings and accessories. All seams and splices shall be glued.

6. Calcium Silicate shall be 13.0 pounds-per-cubic-foot density rigid hydrous calcium silicate segmented type insulation. Insulation shall have a maximum "k" factor per ASTM C 533 of 0.52 Btu×in/hr×ft²× F at 500 F mean temperature. Insulation shall be asbestos-free.

7. Pipe Insulation Jackets - Provide jackets over insulated piping, fittings, flanges and valves. Jackets shall be in accordance with the following table:

Piping Insulation Jackets			
Service	Location	Jacket Type	Color
Chilled Water & Hot Water	All exposed including exposed in Mechanical Rooms	0.030" PVC	White
Refrigerant	Outdoors	0.030" PVC for fiberglass 2 coats of manufacturer's recommended paint plus 0.030" PVC over straight sections for Closed Cellular	White

8. Acceptable manufacturers: Knauf, Owens-Corning, or approved equal.

D. Ductwork:

1. Ductwork indicated to be externally insulated.

a. External wrap shall be 2" thick, 1 pound-per-cubic-foot density (or 2.2" thick 3/4 pound-per-cubic-foot density) commercial-grade duct wrap. Insulation shall have a maximum "k" factor per ASTM C 518 of 0.29 Btu×in/hr×ft²×°F at 75° F mean temperature. Maximum permeability of facing shall be 0.02 per ASTM E 96. Provide with FSK (foil-scrim-kraft) jacket. **[Where external wrap is not concealed, provide paintable white PSK (polypropylene-scrim-kraft) jacket. In lieu of FSK]**

b. Ductwork external rigid board insulation shall be 2" thick, 6 pound density rigid duct board. Provide with FSK (foil-scrim-kraft) jacket. **[Where external insulation board is not concealed, provide paintable white PSK jacket in lieu of FSK.]**

c. External duct insulation shall have a vapor-barrier complying with NFPA 90A with fire and smoke hazard rating as determined by Underwriters Laboratories procedure UL 723, ASTM E 84, and NFPA 255 not to exceed a flame spread of 25 and a smoke developed of 50. Maximum permeability of facing shall be 0.02 per ASTM E 96.

2. Duct Lining (Flexible):

a. Ductwork inside buildings specified to have internal acoustical and thermal lining shall have 1" thick, 1½ pounds-per-cubic-foot density,

coated, flexible duct liner. **[Where specifically indicated provide 2" thick duct liner.]**

b. Liner shall have a maximum "k" factor per ASTM C 518 of 0.23 Btu×in/hr×ft²×°F at 75° F.

c. Liner shall have a coating on the air-side of the lining which shall comply with Underwriters Laboratories procedure UL 723, ASTM E84, and NFPA 255 not to exceed a flame spread of 25 and smoke developed of 50.

d. Liner surface shall be treated with an EPA registered anti-microbial agent to prevent fungal and bacterial growth. The liner shall conform to ASTM C 1338, G21 and G22. The liner shall have an encapsulant edge coating.

3. Cold Equipment:

a. Cold equipment not provided with factory insulation and jacket shall be field insulated. Insulation shall have a maximum "k" factor per ASTM C 177 or C 158 of 0.28 Btu×in/hr×ft²×°F at 75° F mean temperature. Maximum permeability rating shall be 0.17 per ASTM C 355. Flame and smoke hazard shall comply with NFPA 90A as determined by ASTM E 84 not to exceed a flame spread of 25 and smoke developed of 50.

b. Adhesive used to secure insulation to equipment, etc., shall be of the contact type, approved by the insulation manufacturer, be compatible with the insulation and have the same fire and smoke hazard rating as the insulation.

E. Boiler Breeching and Flue:

1. Boiler breaching, flue and fittings inside building, between boiler and exterior of building or connection to masonry chimney furnished under other Divisions, shall be insulated with 13.0 pounds-per-cubic-foot density rigid hydrous calcium silicate, or perlite split or segmented type insulation.

2. Insulation shall have a minimum "k" factor per ASTM C 355 or C 533 of 0.52 Btu×in/hr×ft²×°F at 500° F mean temperature.

2.6 DUCTWORK

A. General:

1. Inlet and outlet connections to fan equipment shall be made with flexible fiberglass, nylon cloth a maximum of 10" in length. The cloth shall be flame

retardant and have a maximum flame spread rating of 25 and a maximum smoke developed rating of 50.

2. Joints and seams in duct systems shall be sealed with joint sealant.

3. Ductwork shall be fabricated and installed in accordance with applicable SMACNA standards.

4. Square and rectangular ductwork shall be constructed in accordance with the following table:

SQUARE AND RECTANGULAR DUCTWORK			
Service	SMACNA Pressure rating (Inches WG)	SMACNA Seal Class	Insulation Type
Supply Ductwork in VAV systems upstream of VAV Boxes	4	A	External
Supply Ductwork in VAV systems downstream of VAV Boxes	2	B	External
Supply Ductwork in constant volume systems	2	B	External
Return Air Ductwork for Constant Volume systems	2	C	External
Return and Transfer Air ductwork for VAV systems	2	C	External
Outside Air Ductwork	2	C	External
Exhaust Ductwork	2	C	None

5. Round and oval ductwork shall be constructed in accordance with the following table:

ROUND AND OVAL DUCTWORK			
Service	SMACNA Pressure rating (Inches WG)	SMACNA Seal Class	Insulation Type
Supply Ductwork in VAV systems upstream of VAV Boxes	4	A	External
Supply Ductwork in VAV systems downstream of VAV Boxes	2	B	External
Supply Ductwork in constant volume systems	2	B	External
Return Air Ductwork	2	C	External
Outside Air Ductwork	2	C	External
Exhaust Ductwork	2	C	None

B. Supply, Return, Outside Air and Exhaust Ductwork:

1. Square and Rectangular:

a. Ductwork shall be constructed from galvanized sheet steel. Gauges and construction standard shall be in accordance with "SMACNA HVAC Duct Construction Standards, Metal and Flexible", latest edition.

b. 90-degree elbows in square and rectangular ductwork shall have single-thickness turning vanes on 1½" centers. Other changes in direction less than 90-degrees shall be made with radius type fittings.

c. **Sizes indicated on the drawings are sheet metal sizes. Where applicable, allowance has already been made for the lining.**

2. Round and Oval:

a. Except where indicated otherwise, duct and fittings as shown on the drawings shall be unlined, round or oval, spiral wound, manufactured from galvanized sheet steel complying with ASTM A653/653M, A924/A924M. Where indicated, ductwork and fittings shall be stainless steel. Ducts shall have lockseam construction.

b. Fittings shall be compatible with the duct and provided by the duct manufacturer. Elbows up to 8" in diameter shall be die-formed, elbows 9" and larger shall be segmented. Fitting joints shall be brazed or welded.

c. Snap-lock ductwork will not be allowed.

d. Joints between duct and fittings shall be flanged type for exhaust systems and shall be either slip or flanged type for supply.

2.7 FLEXIBLE DUCTS

A. Flexible ductwork shall be acoustical type Flexmaster 8M or equal, factory-fabricated, preinsulated assembly rated for a positive working pressure of 10" w.g. Assembly shall consist of a laminate inner liner encapsulating a high-tensile, spring steel helix wire. A fiberglass blanket with an insulating value of $R=6.0^{\circ}\text{F}\cdot\text{Ft}^2\cdot\text{Hr}/\text{BTU}$ shall cover the inner liner. Increase insulation thickness to provide an insulating value of $R=8.0^{\circ}\text{F}\cdot\text{Ft}^2\cdot\text{Hr}/\text{BTU}$ where flexible ductwork is installed in an non-air conditioned space. The insulation shall be covered with a reinforced metalized jacket. Jacket shall have a perm rating of 0.01 per ASTM E 96-A. The entire assembly shall comply with UL 181, NFPA 90A and 90B as a Class 1 Air Duct Material. Assembly shall also have a flame spread rating of 25 or less and a smoke developed rating of 50 or less. Where flexible duct is not concealed, remove the factory insulation and insulate with external duct wrap with paintable white PSK (polypropylene-scrim-kraft) jacket as specified for externally insulated round ductwork.

2.8 DUCT FITTINGS

A. Spin-in

1. Each rigid or flexible round duct shall be connected to the square or rectangular sheet metal main or branch ducts using an engineered, galvanized, sheet metal fitting as shown on drawings.

2. Fittings shall be constructed of heavy gauge, galvanized sheet steel with riveted construction. Where duct sizes allow, provide conical-converging type to reduce the pressure-drop through the fitting. Throats of fittings shall be constructed so that positive seals are provided when fittings are installed.

3. The following options shall be factory-installed in the fittings:

a. Adjustable dampers with spring loaded retractable bearings and positive-locking, damper regulators with handles (delete dampers over gypsum board ceilings and delete dampers in VAV systems upstream of VAV boxes).

2.9 DUCT ACCESS DOORS

A. Frame shall be 22-gauge galvanized steel with neoprene gasket seal and "dove tail" edges to attach to ducts. Size of doors shall be as required to service item inside duct.

B. Doors shall be 22-gauge galvanized steel with continuous piano hinge and cam locks. Quantity of locks shall depend on door size.

C. Door shall be insulated with 2" thick, fiberglass insulation compressed to 1". "R" factor shall be 7.7.

D. Doors in range hood exhaust ductwork shall be UL listed for grease duct service.

2.10 DUCT JOINT SEALANT

A. Indoor Application:

1. Duct and duct mounted equipment installed indoors shall be sealed using a mineral-gypsum impregnated fiber tape and a liquid adhesive. Tape and adhesive shall have a combined UL listing of a flame spread of 10 and a smoke developed of 0.

2.11 GAS VENT SYSTEM

A. Gas vent materials shall meet or exceed the equipment manufacturer's specific requirements for the application. Gas vent sizes shall be provided to meet the equipment manufacturers requirements and Building Code requirements for the specific installation. Sizes indicated in the contract documents shall be increased to suit specific project requirements at no additional cost to the Owner. Fully coordinate gas vent materials and sizes during the bidding phase.

B. Atmospheric

1. Flue and fittings for natural draft gas fuel equipment shall be factory-built, double wall flue, listed and laboratory tested by Underwriters Laboratories, Inc. as a Class B vent.

2. Outer-wall construction shall be of galvanized steel. A built-in air space shall separate inner and outer-walls. Inner-wall construction shall be of aluminum.

3. Where flue temperatures up to 600° F are anticipated, inner pipe joints shall be sealed with RTV silicone sealant.

4. Fittings shall be of the same manufacturer as the pipe furnished.

5. Flues extending above roof surfaces shall terminate as required by local code or by NFPA 211.

6. Exterior metal parts or parts above the roof shall be painted as work of other Divisions.

7. Acceptable manufacturers: Selkirk Metalbestos Model RV or QC or approved equal.

C. Forced Draft or Power Gas Equipment Venting

1. Flue and fittings for power gas, liquid or solid-fuel equipment shall be factory-built, double wall flue, listed and laboratory-tested by Underwriters Laboratories, Inc.

2. Outer-wall construction shall be of aluminum-coated steel. A 1" air space shall separate inner and outer-walls. Inner-wall construction shall be type 316 stainless steel.

3. Flues shall be installed in accordance with and shall terminate as required by applicable sections of NFPA 54, NFPA 211 and local building codes.

D. Condensing Equipment Venting

1. The Flue and fittings shall be fully compatible with the gas fired equipment provided. Review manufactures requirements for each piece of gas fired equipment before ordering gas vent materials.

2. Provide Category IV, AL29-4C corrosion resistant sealed vent system. Metal-Fab Inc., Corr/Guard Vent with AL29-4C stainless steel or approved equal.

3. Provide gas vent accessories and installation strict conformance with the equipment manufacturers requirements.

4. Flues shall be installed in accordance with and shall terminate as required by applicable sections of NFPA 54, NFPA 211 and local building codes.

E. Breeching:

1. Rectangular and square boiler breaching and flue, inside the building shall be constructed from 12-gauge (minimum) black steel.

2. Fittings shall be radius type.

3. Joints shall be welded.

4. Breeching and flue not part of a UL listed double wall flue system shall be insulated.

2.12 VIBRATION ISOLATION

A. Provide isolators as specified. Where vertical height for installation is limited, modifications to the isolator connection may be required; i.e., custom brackets or supports to allow mounting of isolators to the side of in lieu of directly under equipment. Minimum deflection shall be in accordance with ASHRAE 1991 HVAC Applications Handbook, Page 42.34 for the specific installation conditions. Provide structural rails or structural bases where equipment base is not self supporting.

B. Isolation Type:

1. The following type isolation shall be provided unless specifically indicated otherwise on the drawings:

<u>Equipment</u>	<u>Type</u>	<u>Description</u>
Air Handling Units	C	Isolator Pad
Base Mounted Pumps	B	Inertia Base with Spring Isolators
Chillers	C	Isolator Pad
Piping Systems	D	Spring and Rubber Hanger

2. Type A: Free-standing, unhoused, laterally stable steel springs incorporating leveling bolts and ¼" thick ribbed noise isolation pads. The springs shall have a lateral spring stiffness greater than 0.8 times the rated vertical stiffness, and shall be designed to provide 50 percent overload capacity. In capacities up to 5,000 pounds, springs shall be replaceable. In capacities over 5,000 pounds, springs shall be welded to the top and bottom load plate assemblies.

Acceptable manufacturers: Amber/Booth, Vibration Mounting Series AC, Kinetics Model FDS, or approved equal.

3. Type B: Reinforced concrete inertia bases with spring isolators. The steel members shall be designed and supplied by the isolator manufacturer. Concrete shall be poured into a welded steel frame, incorporating prelocated equipment anchor bolts, ½" diameter reinforcing bars on nominal 8" centers each way, and recessed isolator mounting brackets to reduce the mount height of the equipment, but yet remain within the confines of the base. The thickness of the base shall be a minimum of 8 percent of the longest span between isolators, at least

6 inches, or as indicated on the drawings. Where inertia bases are used to mount pumps, the bases shall be wide enough to support piping elbows.

Acceptable manufacturers: Amber/Booth, Vibration Mountings Type WPF, Kinetics Model CIB, or approved equal.

4. Type C: Pads shall be individually coated with a flexible moisture impervious elastomeric membrane. Pads shall have a constant natural frequency over the operating load range, and the stiffness shall increase proportionately with load applied. Pads shall be no taller than the shortest horizontal dimension. Where the equipment base does not provide a uniform load surface, steel plates shall be bonded to the top of the pads.

Acceptable manufacturers: Kinetics Model KIP-Q Molded fiberglass, Vibration Mountings - Shear-Flex or Cork-Rib, or approved equal.

5. Type D: Combination spring and fiberglass (or rubber) hangers, incorporating precompressed molded fiberglass (or rubber) noise and vibration isolation pads, coated with a moisture impervious elastomeric membrane in series with springs, each encased in welded steel brackets. Springs shall be as hereinbefore specified. Isolators shall be designed for 50 percent overload capacity, and shall accommodate rod misalignment over a 30-degree arc. Brackets shall be designed to carry 500 percent overload without failure.

Acceptable manufacturers: Amber/Booth Vibrations Mounting Series RSH, Kinetics Model SFH, or approved equal.

2.13 DUCTLESS SPLIT SYSTEMS

A. Trane was used as the basis of design for the system.

B. Provide complete ductless splits systems with the features indicated in the contract documents. The systems shall be provided with all equipment, controls, wiring, piping, insulation, accessories and appurtenances for complete and properly operating systems.

C. Provide five year parts warranty on compressors.

D. Acceptable manufacturers: Trane or approved equal.

2.14 AIR COOLED WATER CHILLERS

A. Each packaged air cooled water chiller shall be completely factory assembled, including interconnecting refrigerant piping and internal wiring of controls, mounted on a steel base which accommodates the air cooled condenser, compressors and cooler. The unit shall be capable of being rigged from the top without a spreader bar. The unit shall be shipped with a full operating charge of refrigerant. Chillers shall contain two

separate refrigerant circuits, each with a separate compressor for standby operation. Each unit shall be rated in accordance with the latest ARI standard and be capable of producing the scheduled performance. Electrical components shall be protected from the weather. The unit shall be enclosed in a galvanized steel casing, zinc phosphatized, with baked enamel finish.

B. The compressors shall be rotary screw type. Provide a minimum of two compressors/unit. The compressors shall be mounted on spring isolators.

C. Manual restart of unit shall be required after motor stoppage due to thermal overload. Each compressor shall be equipped with an insert type crankcase heater to minimize oil dilution during shutdown periods. A contactor and a calibrated, manual reset ambient-insensitive overload protection shall be factory installed for each compressor motor. The protection shall be open the 3 phases in the event of overload in any one phase.

D. Each unit shall be factory equipped with an electrically operated device for loading and unloading compressor and a control for cycling compressors. Unloading shall be controlled by a solid state temperature controller.

E. The temperature controller shall be easily adjustable in the field.

F. The cooler shall be direct expansion multiple circuit and removable tube type with refrigerant in the tubes and liquid to be chilled in the shell. The design working pressure of the cooler shell (liquid) side shall be 150 psig; and 225 psig for the tube (refrigerant) side. Refrigerant heads shall be removable. The cooler shall be equipped with a heater cable, covered with fiberglass insulation and protected with a steel jacket for freeze up protection to -20° F ambient. The cooler shall be constructed and tested in accordance with ASME code requirements. The water connections shall be fully accessible without going through condenser sheet metal panel sections.

G. The condenser coil shall be constructed of seamless copper tubes, arranged in staggered rows, mechanically expanded into aluminum fins. The design working pressure of the condenser coil shall be 450 psig. The condenser shall include, as an integral part of the design, a subcooling circuit. The condenser coils shall be fully protected by sheet metal panels, or coil guards protecting finned surface.

H. The condenser fans shall be propeller type, providing vertical air discharge. Fan blades shall be statically and dynamically balanced, protected at outlet by anodized fan blade safety guards. Each fan shall be driven directly by an individual motor. The condenser fan motors shall be of the three phase high torque type, inherently protected, ball bearing construction, permanently lubricated and equipped with 5 year lubrication plugs.

I. The refrigerant circuit shall be constructed of copper tubing with brazed joints, and shall include: shut-off valve with charging connection, sight glass moisture-liquid indicator, direct acting thermal expansion valve, solenoid valve and filter-drier. The entire

suction line and liquid line between the expansion valve and the cooler shall be insulated with flexible closed cell insulation. High pressure relief valve shall be factory installed.

J. The unit shall have separate control and power sections. Controls and motor starting equipment shall be factory wired and mounted in weatherproof compartments, and shall include: control fuses, high and low pressure cut-outs, oil safety switch, freeze protection control; freeze, high pressure and low oil pressure safety lights, timer to prevent compressor short cycling, interlocks for inherent motor protection cooler heater thermostats, low ambient temperature control, recycling pump down circuit, provisions for wiring in remote alarm, on-off switch, and air conditioning system time clock interlock contacts, fan cycling pressure control, 3-phase solid state fan speed controls, high discharge temperature cut-out, solid state operating thermostat with adjustable water temperature setpoint and operating range. Pressure differential switch shall be provided for field mounting. A factory supplied bracket for mounting the control and power wiring disconnect switches shall be included. The compressor power terminals shall be capable of accepting either copper or aluminum wire of the size indicated on the Division 16 drawings.

K. A qualified factory service representative shall supervise the installation of the chillers, and completely check the unit controls and refrigerant circuits. The service representative shall place the unit in working order, log the machine, and instruct the Owner's personnel in the maintenance and operation of the unit.

L. Provide 5 year parts warranty for compressors.

M. Acceptable manufacturers: Trane, York, or approved equal.

2.15 HOT WATER BOILERS

A. Provide gas fired hot water boilers with capacity as scheduled on the drawings. Each boiler shall be a complete package unit, suitable for indoor installation, fully automatic for water heating.

B. The boiler shall be a modulating, sealed combustion boiler.

C. The boiler shall be design certified to comply with the current edition of the Harmonized ANSI Z21.13 / CSA 4.9 Standard for Gas-Fired Low Pressure Steam and Hot Water Boilers. The boiler shall be designed and constructed in accordance with the ASME Boiler & Pressure Vessel Code, Section IV requirements for 160 psi (1103 kPa) working pressure.

D. The boiler shall be capable of normal operation and full input with supply gas pressure as low as 4" w.c. Boiler shall automatically compensate for large fluctuations of gas supply pressure between 4" w.c. and 13" w.c.

E. The water tube heat exchanger shall be a vertical round design, with 7/8" inner diameter integral finned copper tubes. The tubes shall be rolled directly into lined

ASME headers rated for 160 psi (1103 kPa) working pressure. All waterways shall be non-ferrous. The heat exchangers shall be a low water volume design. All gaskets shall be non-metallic, and separated from the combustion chamber by at least 3.5" (89mm) to eliminate deterioration from heat. Headers shall have covers permitting visual inspection and cleaning of all internal surfaces. The piping side header shall have threaded nipples to facilitate maintenance and permit removal of complete heat exchanger for service or replacement. The heat exchanger shall be removable from the unit, without excessive disassembly of the boiler's combustion chamber .

F. The boiler shall use a proven hot surface ignition with a 15 second pre-purge cycle to clear the venturi assembly and combustion chamber. The boiler shall start in low fire, and remain in low fire for 15-seconds at the start of each cycle. The boiler shall be 120V, single phase, 20A.

G. The burner shall be cylindrical type with woven metal fiber to provide a cleaner, more complete fuel combustion and low Nox emission, not exceeding 10 PPM.

H. The boiler shall come complete with an inline mounted pump sized to provide the correct boiler flow rate for primary/secondary applications. Each unit shall be furnished with an energy management monitor relay and pump timer. The timer shall be a high quality solid state electronic device. The device shall be user adjustable from 0.1 to 10 minutes for continued pump circulation after the call for heat has been satisfied, to remove residual heat from the unit.

I. The combustion chamber jacket shall be compact, utilizing a lightweight alumina-silica insulation tile board rated to 2200°F. The outer jacket shall be a unitized shell finished with acrylic thermo-set paint baked at a temperature not less than 325°F. The frame shall be constructed of 2" x 2" x 11 gauge box steel. The flue collector shall be constructed of 10 gauge steel for strength and durability. The jacket shall have access panels on each side of the boiler, to facilitate inspection and service of internal components.

J. The boiler shall have a forced draft design that is capable of precisely mixing the air and gas to achieve a minimum 90% steady-state combustion efficiency. The boiler shall employ a pre-mix fan that is approved for use with flammable gas and air mixtures. The air intake will use single-wall galvanized steel pipe, 24 gauge minimum, to a maximum of 50 linear feet with a maximum of 5 elbows.

K. The boiler shall be designed for vertical venting or for horizontal direct venting applications using stainless steel vent. Venting applications will use type AL29-4C stainless steel pipe to a maximum of 50 linear feet with a maximum of 5 elbows.

L. The boiler gas train shall be for modulating firing and shall consist of a safety gas valve and a gas-air ratio control valve that precisely controls the air and gas mixture, and enables the boiler to modulate, to closely match heat load conditions. The boiler shall be provided with an integral, washable combustion air filter. The air filter shall provide 83% arrestance to protect the burner and blower from debris. The air filter shall be constructed

out of open cell polyurethane foam. The air filter shall be mounted in the boiler, and shall be intended for permanent use in the unit, (not only for the construction phase of the project).

M. The boiler shall be built with a selector switch which enables the user to choose between the unit's mounted modulation control and a labeled terminal strip for connection to an external 0-10VDC control source (such as a building automation system or multiple boiler control). The boiler shall have dry alarm contacts for ignition failure, and shall have the following diagnostic lights: Amber light to indicate power on; Amber light to indicate a call for heat; Amber light to indicate that the unit is in pre-purge; Green light to indicate that the main gas valve has been energized; Red light to indicate ignition failure.

2.16 ELECTRIC DUCT HEATERS

A. Provide electric open coil duct heaters having capacities indicated on the drawings. Voltage size, wattage, number of steps and accessories as scheduled.

B. Heaters shall be UL listed for zero clearance and meet the applicable requirements of the National Electrical Code.

C. Heaters shall be made with galvanized steel frame.

D. Resistance coil terminals and nuts shall be stainless steel, and terminal insulators and bracket bushings shall be of high grade ceramic and securely positioned. Resistance wire shall be iron free, 80% nickel and 20% chromium. Bracket supports for the sheathing shall be reinforced with stiffening ribs and gussets, and spaced no more than four inches apart. Heaters shall be tested dielectrically for 1000V plus twice the rated voltage or 2000V, whichever is higher. Heaters shall be derated to 35 watts/sq.in. of wire surface.

E. Heaters shall be interchangeable for mounting in a horizontal or vertical duct, and air flow may be through the heater in either direction.

F. Electric heaters shall be of the slip-in type.

G. Each heater shall be furnished for electrical characteristics scheduled. Three phase heaters shall be provided with balanced three phase steps.

H. The control panels shall be integral with heater for duct mounting. Enclosure material shall be heavy gauge galvanized steel with gray paint finish. Metal gauge shall meet NEMA I and UL minimum gauge requirements. Control panels with single doors shall have hinged doors. Control panels over 24" in width shall have double doors. Doors shall be secured with heavy duty continuous hinges and latches or 3 point catch, as required. Control panels shall be provided for installation on the bottom or sides of the duct as indicated on the drawings or as required for access to controls.

I. Built-in components shall be mounted and prewired on removable subpanel board. Panels containing SCR's or other heat sensitive equipment shall be provided with adequate heat dissipating devices. Power and control wiring knockouts shall be provided for ease of installation.

J. The terminal box shall be internally insulated. Insulation shall prevent condensation when the heater is in a 50° F air stream.

K. Magnetic contactors and primary fused control power transformers shall be provided. Overcurrent protection shall consist of automatic circuit breakers as required by NEC. An integral fused safety disconnect switch shall prevent the door from being opened unless the disconnect switch is in the off position. When a pneumatic control system is provided a pneumatic electric switch shall be provided to cycle the heater stages in response to a thermostat. Control voltage shall be 24 volts. Magnetic contactors shall be disconnecting type. The contactors shall disconnect power from ungrounded conductors.

L. A differential pressure type air flow switch shall be built into the heater.

M. A disc-type automatic reset thermal cutout shall be provided for primary protection. For secondary protection, a sufficient number of heat limiters (fusible links) in the power lines shall de-energize the elements in case the primary cutout fails. Both devices shall be serviceable through the terminal box without having to remove heater from duct.

N. Heater construction shall be arranged with allowances made for 1" internal duct liner or 2" external duct wrap as required.

2.17 PUMPS

Provide the following type pumps having capacities scheduled on the drawings.

A. End Suction:

1. Provide pumps having capacities scheduled on the drawings. Each pumps shall be flexible coupled, single-stage, vertical split-case type of bronze-fitted construction and quiet operation. The pump internals shall be capable of being serviced without disturbing piping connections.

2. The sealing of the liquid cavity shall be by the use of a standard mechanical seal.

3. A replaceable shaft sleeve shall be employed to completely cover the wetted area under the seal or packing.

4. Each impeller shall be one-piece bronze, machined, enclosed type, hydraulically and dynamically balanced, keyed to the shaft and secured by a suitable, locking cap screw.

5. Each pump shall be factory-tested for the specified operating conditions. It shall then be thoroughly cleaned and painted with at least one coat of high-grade machinery enamel prior to shipment.

6. Impeller diameters shall never be greater than 85% of the maximum specified by the manufacturer for a particular casing and shall be specifically cut for scheduled performance.

7. Pumps shall have nonoverloading characteristics throughout the entire curve. Brake horsepower of each pump at the design point shall not exceed the motor nameplate rating under any possible service condition.

B. Each pump suction and discharge connections shall contain threaded gauge tappings for reading pump pressure differential. Pumps not furnished with tappings shall have field installed insert flanges with gauge tappings or spool pieces with gauge tappings. Space requirements must not be exceeded.

2.18 CURBS AND SUPPORTS

A. Prefabricated metal roof curbs shall be provided for roof mounted fans, rooftop air conditioning units, etc.

B. All roof mounted curbs and supports shall be fully coordinated with the roof type and the roofing manufacturer's installation details and requirements.

C. Curbs and rails on sloped roofs shall be sloped to suit the roof and installed on the top surface level.

D. All curbs and rails shall be fastened to the building structure to withstand hurricane force winds.

E. All equipment installed outdoors shall be fastened to their curbs, rails, supports and or building structure to withstand hurricane force winds. Provide galvanized or stainless steel straps or cables to anchor roof mounted equipment securely to structure to withstand hurricane force winds.

2.19 FANS

A. Fans shall be of the sizes and types scheduled on the drawings and shall be complete with back draft dampers and accessories scheduled. Fans shall be rated in accordance with AMCA Standards and shall be AMCA labeled. Fractional horsepower motors shall be provided with internal overload protection.

2.20 DAMPERS

Provide fire dampers and manual volume dampers at locations indicated on the drawings. Installation of dampers shall be in accordance with the applicable requirements of NFPA-90A and the guidelines of the Sheet Metal and Air Conditioning Contractor's National Association (SMACNA). Fire shall be UL approved listed and labeled as required. Dampers shall be installed in full conformance with the damper manufacturer's installation instructions and the dampers' U.L. Listing. The sizes of the dampers listed on the drawings are approximate sizes. Adjustments will be required to suit field conditions. The Contractor shall verify the actual size required by field measurements before final ordering.

A. Fire Dampers:

1. Provide Ruskin DIBD2, Style B dynamic curtain-type fire dampers with interlocking blades and fusible links listed for 165° F.
2. Dampers shall be classified for dynamic closure to a minimum of 4000 FPM and 4" WG static pressure. Fire dampers shall have the same minimum rating as the partitions in which they are installed, but in no case shall the rating be less than 1½ hours in accordance with UL 555 Standard for Fire Dampers.
3. Each fire damper shall be installed within an approved sleeve and secured with mounting angles.

B. Manual Volume Dampers:

1. Damper frames shall be of welded 16-gauge hot rolled galvanized steel construction with integral top and bottom blade stops.
2. Blades shall be constructed of triple-crimped 16-gauge hot rolled galvanized steel. Blades shall be a maximum of 8" wide and shall be of the opposed type, center pivoting and shall have blade edge seals on mating edges.
3. Blade actuators shall be ¼" diameter steel connecting bars attached to alternate blades with 12-gauge blade clips and bronze trunnion pins. Shaft end linkages shall be connected to adjacent blades.
4. Blade shafts shall be ½" diameter with steel stub ends on all but actuator shaft which shall be full length of blades with 6" extension and locking hand quadrants for duct mounting. Bearings shall be nylon type.
5. Dampers larger than 48" in any dimension shall be provide in multiple sections. Finish shall be standard mill finish.

2.21 AIR DISTRIBUTION DEVICES

A. General:

1. **Ceiling mounted air distribution devices shall be fully compatible with the ceiling type in each area. See architectural drawings and specifications. Ceiling mounted air distribution devices shall be fully compatible with the ceiling type in each area. All lay-in devices installed in narrow (or wide) tee ceilings shall have narrow (or wide) tee design borders. All lay-in devices installed in ceilings with dropped panels shall be dropped panel design.**

2. For square or rectangular neck diffusers with round branch ducts, provide a square-to-round galvanized sheetmetal adapter with the round neck size equal to branch duct size indicated. Adapter shall be minimum of 4" deep so as not to reduce the effective area of the diffuser.

3. Provide an air extracting device where supply grilles or supply registers are installed on a branch duct tap.

a. At each supply register or grille with a rectangular duct tap not exceeding 1'-6", install a Titus Model AG-45 air-extracting device with a #3 key operator and access through face of register/grille.

b. At each supply register or grille with a rectangular duct tap from 1'-7" long to 3'-0" long and at each ceiling diffuser with a rigid duct tap up to 3'-0" long, install a Titus Model AG-45 air-extracting device with a push-pull wire operator.

c. At each ceiling diffuser with a rigid duct tap over 3'-0" long and any branch duct tap serving two or more supply air devices, provide a Titus Model AG-45 air-extracting device. Device shall be complete with end bearings, square shaft and a concealed operator in an accessible location

B. Registers, Grilles and Ceiling Diffusers:

1. Supply Registers (SR) - Model 272; ¾" spacing, airfoil blades, double deflection register with vertical face bars; Model AG-15 opposed blade damper. Register and damper shall be aluminum construction with #01 aluminum enamel finish.

2. Ceiling Diffusers (CD) - Model TDC-AA; louvered face square and rectangular ceiling diffuser with square or rectangular neck, with removable 1, 2, 3 or 4 way blow cores with opposed blade dampers. Entire diffuser shall be aluminum construction with #25 white enamel finish. Face style shall be Type 6 - beveled drop face.

3. Return Air Grille (RG) - Titus Model 50F; eggcrate grid core with ½" x ½" x 1" grid spacing. Grille shall be aluminum construction with white enamel finish. Frame style shall be Type 1 - surface mount with except for 22x22 sizes installed in lay-in ceilings which shall have Type 3 lay-in frame.

4. Return Air Register (RR) - Same as return air grille plus opposed blade damper.

5. Exhaust Grille (EG) - Same as return air grille.

6. Exhaust Register (ER) - Same as exhaust grille plus opposed blade damper.

2.22 VAV BOXES

A. Terminal units shall have a damper control consisting of a drive plate which is mechanically linked to an extruded aluminum throttling damper. The damper shall be offset pivoted in nylon bushing to balance air pressure forces. The controls shall be arranged to comply with the control scheme specified in Section 15650. The damper operators are to be compatible with the control system specified and shall be provided under Section 15650 and shall be factory mounted by the terminal unit manufacturer.

B. Terminal units shall be fabricated from zinc-coated steel, not lighter than 22-gauge. The interior surfaces of box and sound attenuators shall be acoustically and thermally insulated with non-porous insulation to prevent mold spores, bacteria and air erosion. Insulation shall be 1" thick with a minimum R-Value of 3.9 sq ft deg F h/BTU @ 75 deg F. **Where VAV boxes are installed in non-conditioned spaces, provide an additional external layer of 3/8" thick closed cell elastomeric foam insulation with a minimum R-Value of 1.5 sq ft deg F h/BTU @ 75 deg F to mitigate the potential surface condensation.** Edges of insulation shall be sealed from the airstream. The insulation material shall meet NFPA and NBFU No. 90A Standards as determined by Underwriters Laboratories method - NFPA No. 255 - ASTM E 84-50T. Performance of units shall be based on tests conducted in accordance with ADC Standards 1062R3 and ASHRAE Standard 36B.

C. A center averaging flow cross velocity sensor shall be provided on each box.

D. Where indicated on the drawings and where required to meet scheduled noise criteria, provide custom sized sound attenuators. Attenuators shall be transitioned as required to allow for branch duct connections as shown on the drawings.

E. Electric heat for VAV boxes shall be made with galvanized steel frame. Resistance coil terminals and nuts shall be stainless steel, and terminal insulators and bracket bushings shall be of high grade ceramic and securely positioned. Resistance wire shall be iron free, 80% nickel and 20% chromium. Heaters shall be tested dielectrically for 1000V plus twice the rated voltage or 2000V, whichever is higher. Heaters shall be derated to 35 watts/sq.in. of wire surface. Three phase heaters shall be provided with

balanced three phase steps. Heater control panels shall be integral with heater and shall have hinged doors. Provide heaters with magnetic contactors and primary fused control power transformers. Overcurrent protection shall consist of automatic circuit breakers as required by NEC. An integral fused safety disconnect switch shall prevent the door from being opened unless the disconnect switch is in the off position. Fused disconnect shall have Class R rejection feature. Provide current limiting and time delay type RK-1 fuses. Control voltage shall be 24 volts. Magnetic contactors shall be disconnecting type. The contactors shall disconnect power from all ungrounded conductors. A differential pressure type air flow switch shall be built into the heater. A disc-type automatic reset thermal cutout shall be provided for primary protection. For secondary protection, a sufficient number of heat limiters (fusible links) in the power lines shall de-energize the elements in case the primary cutout fails.

F. VAV boxes shall be Titus, Price, Nailor, Krueger, Trane, Siemens, Enviro-Tec, or approved equal.

2.23 WALL LOUVERS

A. Exterior

1. Louver shall bear the AMCA Certified Rating Seal and have a minimum of 50 percent free area when calculated in accordance with the method described in AMCA Standard 500.

2. Louver shall be 6" deep drainable blade type and shall have extruded aluminum blades and frame not less than 0.081" thick. Blades shall be on 3½" centers with reinforced V's and integral vertical downspouts on each side of louver blades to drain water from the blades.

3. A ½" mesh screen constructed of aluminum wire mounted in an aluminum frame shall be provided and secured to the interior louver frame with sheet metal screws.

4. Louver shall pass 1000 fpm free area velocity with less than 0.16" of w.g. pressure drop with less than 0.01 oz. of water per square foot of free area per AMCA Standard 500.

5. Louver shall have anodized finish with color selected by the Architect.

6. Acceptable manufacturers: American Warming and Ventilating, Arrow United, Construction Specialties, Ruskin, or approved equal.

2.24 CHILLED AND HOT WATER TREATMENT

A. General:

1. Provide equipment and chemicals and provide the necessary service for a complete and operating water treatment system. A single water treatment company shall be responsible for products and services and be a recognized specialist in the field of industrial water treatment for a minimum of 10 years. The water treatment company shall have regional water analysis laboratories, research and development facilities, plus technical service representatives located within the trading area of the job site.

2. The water treatment products and services shall be similar to the type provided by the Mogul Corporation, Nalco Chemical Co. or approved equal.

B. Preoperational System Cleanout:

Chilled and Hot water lines and related equipment shall be thoroughly flushed-out with precleaning chemicals designed to remove deposits such as pipe dope, oils, loose rust, mill scale and other extraneous materials. Add recommended dosages of precleaner chemical products and circulate throughout the water system. Drain, fill and flush water system until no foreign matter is observed and total alkalinity of the rinse water is equal to that of the make-up water.

C. Chemical Feeding and Control Equipment:

1. Chilled and Hot Water System: For each system, install a Mogul One-Shot Feeder with funnel, and air release valve, minimum five gallon capacity and designed to meet pressure requirements of the system.

D. Water Treatment Chemicals:

1. Chilled and Hot Water System: Provide one year's supply of the recommended formula for scale and corrosion protection of closed recirculating system. Formulation shall not contain any ingredients which are harmful to system materials or construction.

E. Testing Equipment:

1. Provide basic water test equipment, including carrying case and spare reagents for maintaining control of program standards in the chilled and hot water systems. Test kits shall include the following:

a. Reagents and apparatus for determination of corrosion inhibitor level in the chilled and hot water system.

b. Reagents and apparatus for determination of pH, P & M alkalinity and chlorides.

c. Apparatus for determination of microbiological colony population and biocide effectiveness.

F. Water Treatment Service Program:

1. The water treatment supplier shall provide consulting services for a period of one year from start-up of the cooling system which will include:

- a. Installation and system start-up procedure recommendations.
- b. Preoperation system cleanout procedure supervision.
- c. Initial water analysis and recommendations.
- d. Training of operating personnel on proper feeding and control techniques.
- e. Periodic field service and consultation meetings.
- f. Any necessary log sheets and record forms.
- g. Any required laboratory and technical assistance.

2. Services shall be provided by a qualified, full-time representative of the water treatment supplier.

2.25 ELECTRICAL WORK

A. Materials shall be new and shall be Underwriters Laboratories labeled or listed.

B. Wiring shall be contained in metallic raceways. Raceways shall meet the requirements of DIVISION 16 - ELECTRICAL.

C. Wiring for 115 volts and higher shall be copper #12 AWG or larger. Wiring type, insulation, etc. shall meet the requirements of DIVISION 16 - ELECTRICAL.

D. Wiring less than 115 volts shall be copper. Wire size, type and insulation shall be selected to suit the application.

PART 3 - EXECUTION

3.1 PIPING

A. General:

1. Piping shall be installed to permit proper circulating of fluids and to permit drainage. Circulating water piping shall be pitched upward in the direction

of flow. Installation of piping shall include accessories as hereinbefore specified, as shown on the drawings or as required for the proper operation of the system.

2. Changes of pipe sizes shall be made by using eccentric pipe reducers only. In pump suction connections the flat part shall be on the top. In all other piping the flat part shall be on the bottom. The use of bushings is prohibited.

3. Manufactured fittings only shall be installed on piping 2½" and smaller. Manufactured fittings shall be used on piping systems 3" or larger except "weld-o-lets" or "thread-o-lets" may be used for branch connections if the branch is less than one-half the size of the main. The use of "stab" type connections is prohibited.

4. Piping shall be racked and handled in a manner to prevent the entrance of dirt or foreign matter. Open pipe ends shall be plugged or capped at the end of each working day.

5. Automatic air vents shall be provided at each high point in the system and drain valves shall be provided at each low point. Drain lines from air vents shall be piped to the nearest floor drain or drain pan. Drain valves shall be terminated as shown on the drawings or as specified under INSTALLATION OF VALVES.

B. Drain Line Piping:

1. Provide for evaporator coils and air conditioning equipment, a complete drainage system. Lines shall be installed to pitch down in the direction of flow not less than 1 inch in 40 feet, changes in directions shall be made using tees with plugs or caps.

2. Cooling coil drain outlets shall have a deep seal trap as detailed on the drawings.

3.2 TESTING AND CHARGING REFRIGERANT SYSTEMS

A. The system shall be pressurized with dry nitrogen to 450 psi on the high pressure side and 150 psi on the low pressure side. Each joint shall be leak checked using a soap-water solution; leaks shall be corrected and the system retested as hereinbefore described. When the system proves tight, the pressure shall remain on the system for 24 hours with no drop in pressure. Line pressure and ambient temperature readings shall be taken immediately after the system is determined to be leak-free and again 24 hours later. A correction of 0.3 pounds per square inch will be allowed for each degree change between the initial and final temperature of the ambient air.

3.3 PREPARED OPENINGS

A. Insulated ducts and piping passing through prepared openings and pipe sleeves shall have a 0.016" aluminum jacket installed over the external insulation. Jacket

shall extend a minimum of 2" on either side of the wall. Secure jacket on each end with aluminum draw bands.

B. Where wall is fire and/or smoke rated and the opening is required to be sealed, the annular space between the two metal surfaces shall be packed solid with mineral fiber type fire rated safing insulation.

C. Where ducts and piping are exposed in any area or below a suspended ceiling a sheet metal flange or a chrome plated escutcheon large enough to cover the annular space and sleeve flange shall be installed.

3.4 PIPE JOINTS

Refer to SECTION 15010 - MECHANICAL GENERAL PROVISIONS for installation of any pipe joints.

3.5 SPECIALTIES

A. Flow Balancing Device:

1. Flow balancing devices shall be installed with the manufacturer's recommended straight length of pipe in front of and behind the device.

2. Readout connections shall be installed so that they are easily accessible and are above the horizontal center line of the fitting.

B. Gauges and Gauge Cocks:

1. Gauge cocks and T&P plugs shall be installed so that they are easily accessible and usable.

2. Permanently-installed gauges shall be positioned so that they are easily readable.

C. Flexible Connectors:

1. Flexible connectors shall be installed where indicated on the drawings. Connectors shall be installed at right angles to each other.

2. Piping systems shall be adequately supported on each side of the connectors as required.

D. Air Separators:

1. Separators shall be installed in the vertical position and sufficient clearance shall be provided for strainer removal.

2. Separators shall be adequately hung from the structural system or supported from the floor independently of the piping system.

3.6 INSULATION

Tubing, pipe, fittings, valves, ducts, equipment, accessories, etc., shall be insulated as hereinbefore specified unless otherwise noted.

A. Piping System:

1. Piping installed inside the building shall be insulated with pipe insulation as hereinbefore specified.

2. Where insulation is installed between hangers and pipe, install an 18" long section of rigid insulation of similar thickness suitable to support the pipe and its contents at each hanger, saddle, or support location. Insulation type and density shall be selected so that compression does not exceed 1/16".

3. Fittings and valves shall be insulated as hereinbefore specified. Fitting insulation shall be covered with jacket covers. Jacket cover joints shall be fastened using stainless steel tack fasteners, pressure sensitive tape, brushed-on vapor barrier mastic or any approved combination.

4. Pipe Joints:

a. Fiberglass:

1) Transverse joints in exposed fiberglass insulation shall be secured by self-adhering butt strips.

2) Longitudinal joints in exposed fiberglass insulation shall be secured by self-adhering lap strips which are an integral part of the vapor barrier jacket.

3) Longitudinal joints in concealed fiberglass insulation shall be secured as specified for exposed insulation or may be stapled by using outward clinching staples.

4) If the self-adhering lap strips do not adhere firmly, the Contractor shall resecure the defective lap strips by stapling. Stapling will only be allowed in concealed spaces. Exposed insulation shall be replaced.

b. Elastomeric:

1) Where possible, tubular insulation shall be slipped onto the piping prior to joining piping.

2) When installing on already joined piping systems, insulation shall be slit longitudinally, snapped over the pipe and longitudinal and butt joints shall be coated with contact adhesive and glued together.

3) Fittings shall be insulated by mitering and notching insulation. Valves shall be insulated by using oversized insulation. Joints shall be sealed.

B. Protective Covering (Piping):

1. Insulation shall be covered with a PVC jacket secured with adhesive and staples.

2. Where insulation is installed exposed to the weather insulation shall be covered with two layers of 15 pound inorganic roofing felt secured in place with aluminum tie wires in 12" centers. Transverse joints of the felt shall be lapped a minimum of 6". The felt shall be covered with a PVC jacket, as hereinbefore specified.

3. Fitting insulation shall be covered with UV stabilized PVC jacket covers. Joints shall be waterproofed.

C. Ductwork:

1. External Wrap:

a. Any supply, return and outside air ductwork and fittings not hereinafter specified to be internally lined shall be externally insulated with insulation as hereinbefore specified.

b. Joints and seams in the duct wrap shall be secured by a double row of staggered outward clinching staples on 6" centers. Staples and joints shall then be sealed by applying an approved pressure sensitive foil tape.

2. External Board Insulation:

a. Any exposed air ductwork which is externally insulated shall be covered with board insulation.

b. Board insulation shall be impaled over weld pins or studs and secured with clips, spaced on not more than 16' centers. At pins or stud locations, apply a 4" x 4" layer of vapor barrier material adhered with vapor barrier adhesive at each pin or stud penetration.

c. Firmly butt sections of insulation board and cover with glass fiber reinforced vapor barrier tape.

3. Where insulated ducts or equipment connect to lined ducts the insulation shall extend over the lined duct a minimum of 6". For cold ducts the ends of the duct lap shall be sealed to the lined duct with vapor barrier tape and mastic.

D. Protective Covering (Ductwork):

1. Insulate exterior of ductwork exposed to the weather or where noted or indicated on the drawings with 1 layer of 1½" thick and 1 layer of 1" thick rigid fibrous-glass duct board with integral foil faced vapor barrier.

2. The first layer of board shall be secured to the sheet metal with 100 percent coverage of approved mastic and mechanical fasteners installed per SMACNA Duct Liner Application Standard. The second layer of board shall have the joints staggered a minimum of 6" and shall be secured to the first layer of board with 100 percent coverage of approved mastic. Edges and butt joints shall be sealed with fiberglass fabric embedded in an approved waterproof mastic. Joints shall have fiberglass fabric embedded in each layer of mastic. Vertical duct sections shall also have mastic.

3. The entire duct/insulation assembly shall be protected by a 24-gauge aluminum covering which shall protect the top and both sides of the assembly. The covering shall be removable but shall be secured to withstand the wind velocities encountered in the area. Joints in the aluminum covering shall be watertight.

E. Equipment:

1. Cold Equipment:

a. Insulate cold equipment, which has a normal operating temperature of 55° F or less, such as, but not limited to:

- 1) Chiller evaporator and adjacent cold surfaces.
- 2) Chilled water air separators and compression tanks.
- 3) Chilled water pumps and suction diffusers.

b. Insulation may be applied as a single layer or multiple layers of sheet-type elastomeric insulation which shall total 1½" in thickness.

c. Adhesive shall be applied in accordance with the manufacturers instructions.

d. Insulated parts of other prefabricated equipment such as, but not limited to ceiling diffusers, mixing boxes, variable volume control boxes, coils, dampers, heaters, filters, etc., installed in or part of a duct system which is required to be insulated or lined by these specifications shall be externally insulated to prevent condensation or excessive heat loss of equipment. Insulation shall be as hereinbefore specified.

2. Hot equipment:

a. Insulate hot equipment, which has a normal operating temperature of 110° F or higher.

b. Insulation may be applied as a single layer or multiple layers. Insulation shall be 1½" thick.

3.7 DUCT SYSTEMS

A. Duct systems shall be constructed and installed in accordance with "SMACNA HVAC Duct Construction Standards" latest edition and good engineering practices.

3.8 INSULATED FLEXIBLE DUCT

A. Flexible duct shall be installed straight with as few bend and kinks as possible. Maximum length of flexible duct between main, trunk or branch duct and diffuser shall be 8 feet. Maximum length of flexible duct between main, trunk or branch duct and a VAV box shall be 5 feet.

B. Duct shall be supported at intervals not to exceed manufacturers recommended spacing using metal or approved fabric type hangers.

C. Flexible ducts shall not be installed through walls or partitions.

D. Cut duct to required length. Fold back outer vapor barrier jacket and insulation. Slide inner liner over the sheet metal "tap" and tightly secure the liner as follows:

1. High pressure side of equipment (between main, trunk or branch duct and VAV box) - Stainless steel "radiator type" draw bank with helical screw.

2. Low pressure side of equipment (between main, trunk, or branch duct and diffuser and between VAV box and diffusers) - Plastic "wrap-ties".

E. After inner liner is secured, slide insulation and vapor barrier jacket over inner liner and secure with a plastic "wrap-tie". Seal joint between outer jacket and insulation wrap (where required by specifications) with a vapor-proof mastic.

3.9 DUCT ACCESS DOORS

A. Access doors shall be installed adjacent to fire dampers, smoke dampers, duct smoke detectors, electric duct heaters and terminal heating coils.

B. Doors shall be installed in ductwork on the upstream side of the equipment, so that the door can be fully opened and item inside ductwork can be readily serviced.

C. Where required due to space problems, the hinge may be omitted and double cam locks provided.

3.10 DUCT SEALANT

A. Duct sealants shall be used as follows:

1. Embedded fabric and mastic type may be used on any system.
2. Liquid type may be used only on round slip-joint type fittings and ductwork.
3. Gasket type may be used only on flanged joints.
4. Mastics may be used on flanged joints, as a fillet or groove sealant and as a surface sealant between ductwrap and a rigid duct system.

3.11 VIBRATION ISOLATION

A. Install vibration isolators as hereinbefore specified for equipment specified on this project.

B. Specified type isolators shall be installed on each suspended piping system 1" diameter and larger. Piping/tubing systems coming from or going to equipment requiring isolators shall be provided with isolators for a minimum of 50 feet from each piece of equipment.

C. The first 3 hangers from the equipment shall be capable of handling the same deflection as the equipment isolators. Remaining isolators shall provide $\frac{3}{4}$ " deflection.

3.12 EQUIPMENT

A. Where equipment is suspended from the building structure, the suspension system shall include vibration isolators of the rubber in shear type unless special treatment as specified under Section 15010 is needed, as for floor mounted equipment.

B. Provide galvanized safety pan under equipment containing cooling coils (air handlers, blower coil units, etc.).

C. If required due to excess vibration the Contractor shall statically and dynamically balance air handling and ventilating unit fan wheels after the equipment has been installed. Fan wheels must be balanced to within ½ the ARI tolerance levels. A copy of the balance report must be forwarded to the Architect.

3.13 AIR DISTRIBUTION DEVICES

Grilles, diffusers, door grilles, etc., shall be adequately secured using only oval-head, countersunk, sheet metal screws or screws specifically provided by the device manufacturer. Finish on head of fastener shall match the finish of the device.

3.14 FLUSHING AND CLEANING

Piping, coils, heaters, etc., installed for heating, cooling or other operations of the building shall be thoroughly flushed of debris and foreign objects before any system is placed in operation. After flushing strainers, traps and dirt legs shall be checked and cleaned.

3.15 TESTS OF PIPING

Tests described below shall be made in the presence of the Architect and a representative of the authority having jurisdiction, if required.

A. Water (chilled and hot water)

1. Piping shall be hydraulically tested for four hours with no drop in pressure. Test pressure shall be 125 psi or 1½ times the working pressure, whichever is greater.

3.16 TESTING AND BALANCING OF AIR AND HYDRONIC SYSTEMS

A. Scope of Work:

1. The services of a single, independent air balance and testing agency, approved by the Architect, shall be obtained to test, adjust and balance supply, return, exhaust and hydronic systems. The agency shall specialize in the testing and balancing of heating, ventilating, air conditioning and hydronic systems.

B. General Requirements:

1. Testing and balancing shall be performed in complete accordance with the sections applicable to air distribution and hydronic balancing of the Associated Air Balance Council (AABC), National Standard for Field Measurement and Instrumentation latest edition.

2. The testing and balancing firm shall be an Agency whose primary responsibility is testing, adjusting and balancing of heating, ventilating, air conditioning and hydronic systems.

3. Testing and balancing shall not begin until systems have been completed and are in full-working condition. Heating, ventilating, air condition and hydronic equipment shall be put into full operation by the Contractor and shall continue the operation of same during each working day of testing and balancing.

4. The work required herein shall consist of setting air volumes, water flows, and speed adjustments to within 10 percent of design requirements as shown on the drawings or listed in the specifications.

5. A minimum of two visits to the job site, for inspection of duct installation and damper accessibility, pipe installation and flow measurement points are required during construction prior to the installation of the ceilings. Any inconsistencies found or additional balancing dampers or measuring points needed shall be reported to the Architect.

6. The Test-and-Balance Agency shall cooperate with the Architect, Mechanical, Controls and Sheet Metal Sub-contractors, to effect smooth coordination of the balancing work with job schedule.

7. Upon the completion of the test and balance work, with test data recorded, the Test-and-Balance Agency shall submit six copies of the completed report to the Architect for his review and evaluation.

8. Prior to review of the balancing of the air conditioning system, the Architect may request that the balancing Contractor perform a "spot check" a selected 10 percent of air outlets in his presence. If the readings do not coincide with the report or within specified tolerances, the system balance shall be rejected and the Test-and-Balance Agency shall be required to rebalance the system. This procedure shall be repeated until the balance of the system is acceptable.

C. Submittals:

1. Copies of a detailed procedure to be followed in the testing and balancing of each air distribution, exhaust and hydronic system being used in this project shall be submitted to the Architect as described in SECTION 15010 - MECHANICAL GENERAL PROVISIONS. An acceptable copy must be returned to the Architect before balancing work is begun.

2. Sample forms to be used in listing information and data shall be submitted.

D. Additional Work:

1. Remove, purchase and install any replacement fan sheaves, belts, or any component of the fan drive assembly and any balancing dampers necessary to balance the system.
2. Install clean filters as described in other Sections of the specifications, prior to the beginning of the testing and balancing work. Temporary filter media for the purpose of protecting permanent filters during balancing may be used.
3. Air Handling Unit total air flows shall be balanced for "dirty" filter conditions. If necessary, provide manual dampers or temporary perforated plates or other approved restriction to simulate these conditions.
4. Debris resulting from or caused by installation of air conditioning and exhaust duct work shall be removed. Suction and discharge plenums shall be clean and made ready before the commencement of the balancing work.
5. Remove and clean strainers. Operate air vents at the high points of the system to eliminate air.

E. Air Balancing Procedure:

1. Pitot transverses shall be taken in main ducts to obtain the cfm of each fan.
2. Minimum standards, as listed in the Associated Air Balance Council (AABC) National Standards shall be followed in balancing each system installed on this project.
3. The following items shall be tested, recorded, and incorporated in the test and balance report. The report shall not be limited to these items but shall include these tests as minimum requirements.
 - a. Record fan numbers, manufacturers, model numbers and serial numbers.
 - b. Test, adjust and record required and measured total cfm for each fan system.
 - c. Test, adjust and record any required and measured outside air and return air quantities.
 - d. Test and record required and measured system static pressures; filter differentials, coil differentials and fan total static pressures.

- e. Record any installed fan drive assemblies, fan sheaves, motor sheaves and belts.
- f. Record each installed motor manufacturer and each motor horsepower together with nameplate electrical characteristics; i.e., voltage, amperes, hertz and rpm.
- g. Test, adjust and record each blower rpm.
- h. Test and record any entering and leaving air D.B. temperatures.
- i. Test and record any entering and leaving air W.B. temperatures.
- j. Test and adjust any supply, return, outside and return air ducts to proper design cfm.
- k. Test and adjust the cfm delivery of each diffuser, grille, and register to within 10 percent of design requirements.
- l. Identify and record the location of each diffuser, grille and register.
- m. Record size, type and manufacturer of each grille, register and diffuser.
- n. Data obtained for each diffuser, grille and register shall include required fpm velocity and test resultant velocity, required cfm and test resultant cfm after adjustments.
- o. Diffusers, grilles and registers shall be adjusted to minimize drafts.
- p. Tests shall be made with supply, return and exhaust systems operating, and doors, windows, etc., closed or in their normal operating condition.
- q. Damper positions shall be permanently marked after air balancing is complete.
- r. Cooperate with control contractor's representative. Automatically operated dampers shall be set and adjusted to operate as specified or indicated. Testing agency shall check controls for proper operation and calibration.

s. The final balanced condition for each area shall include the testing and adjusting of pressure conditions. Front doors, exits, elevator shafts, etc., shall be checked for air flow so that exterior conditions do not cause excessive abnormal pressure conditions.

F. Water Balancing Preliminary Procedure:

1. Balancing of hydronic water systems shall not begin until air balance is complete.

2. Prepare the hydronic water systems for balancing in the following manner:

a. Remove and clean each strainer.

b. Examine water in system and determine if water has been cleaned and treated.

c. Check pump rotation.

d. Check expansion tanks to determine that they are not air-bound or waterlogged and the system is properly charged.

e. Check air vents at the high points of the system to determine that they are installed and operating.

f. Open valves to full-open position. Close coils by-pass valves. Set mixing valves to full coil-flow.

g. Set temperature controls to full cooling for balancing chilled water and to full heating for balancing heating water coils.

G. Water Balancing Procedure:

1. After completion of preliminary procedure the following procedure shall be followed.

a. Test pumps at shut-off to establish impeller size and plot on approved, certified curve.

b. Set chilled and heating water pumps to specified gallons-per-minute delivery.

c. Set and record chilled, condenser, loop, and heating water flows at hydronic equipment (chiller, coils, heat exchangers, cooling towers, closed circuit coolers, etc.).

2. Upon completion of flow readings and adjustments at coils and by-passes, recheck settings at the pumps and readjust if necessary.
3. After each hydronic system has been balanced to design requirements the following test shall be performed and recorded in the final report.
 - a. Test and record leaving water temperatures and return water temperatures through chillers.
 - b. Test and record entering and leaving water temperatures at cooling coils, heating coils and heat exchangers.
 - c. Test and record entering and leaving air temperatures: wet bulb and dry bulb at each cooling coil and dry bulb across each heating coil.
 - d. List mechanical specifications of pumps, rated and actual running amperage, voltage, horsepower of pump motor and shut-off dynamic head.
 - e. Test and record final operating suction and discharge pressures and total dynamic head.
 - f. Test and record drops through each coil and coil by-pass in the system. Set each coil by-pass to match coil full-flow pressure drop.
 - g. Where flow devices are installed test and record actual flow-metered readings and corresponding gallons-per-minute.
4. Valve positions shall be permanently marked after the water balancing is complete.

- END OF SECTION -

SECTION 230900 - HEATING, VENTILATING AND AIR CONDITIONING **CONTROL SYSTEMS**

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes providing labor, materials, and equipment indicated, specified, or necessary for a complete and operating Energy Management and Control System. See SECTION 15010 - MECHANICAL GENERAL PROVISIONS which apply to this Section.

A. DESCRIPTION OF SYSTEM

1. The system herein specified shall be a low voltage (12 or 24 volt) direct digital control (DCC) type Energy Management and Control System (EMCS). The system shall include required wiring, engineering, labor and labor supervision.

2. The components shall be as manufactured by Computrols, no exceptions. To exhibit proven reliability, materials and equipment used shall be standard components, regularly manufactured for this and/or other systems and not custom designed especially for this project. Systems and components shall have been thoroughly tested and proven in actual use.

3. The intent of the specification is to describe the criteria for providing an electric or electronic temperature control system consisting of control devices, control panels, wiring, relays, and other materials and devices required to accomplish the functions and operation described herein.

B. QUALIFICATIONS

The control company shall have a 10-year successful history in the design and installation of systems similar in performance to that specified herein.

C. SHOP DRAWINGS

A complete set of temperature control drawings and a complete sequence of control shall be submitted for approval prior to installation or fabrication of any equipment. The Submittal shall include a Schematic Flow diagram for systems and equipment showing locations of instruments and devices along with a written description of the sequence of operation for the system or subsystem depicted in the diagram. Submittal shall indicate interconnecting wiring between devices and equipment. Each drawing shall include a Bill of Material showing device number, quantity, and manufacturers' catalog number for devices shown. Submittal data shall include a schedule of devices to be located, including properly sized control valves. Drawings shall include interlock wiring components, motor starters, contactors and numbered terminals on equipment. Submittal shall include a

detailed EMCS input/output summary and a list of proposed initial setpoints. Refer to SECTION 15010 - MECHANICAL GENERAL PROVISIONS for details.

D. ELECTRICAL WORK

1. Electrical work in connection with work of this Section, and not specified in DIVISION 16 - ELECTRICAL as work of DIVISION 16, shall be done under this Section.

2. Control and power wiring for control devices, including raceways, breakers, disconnects etc. required for a complete and operating control system shall be provided as work of this Section.

3. Separable wells, orifices, and other provisions required for pressure, temperature and flow sensing devices in piping systems shall be provided under this Section for installation under SECTION 15600 - HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS.

4. Pressure taps for static pressure sensors and any other devices installed in air handling systems shall be work of this Section.

E. OPERATION AND TYPE OF SYSTEM

1. General

a. The sequence of operations as described herein is intended to provide a general description of the operation, functions and capabilities required. Some detailed description of features of the control operation are included for clarity.

b. To assist in establishing a means by which certain operations can be accomplished as described, the following should be noted:

1) Interlocks between motors, other devices and equipment may, at the option of the Contractor, be accomplished electrically or electronically.

2) If differential pressure switches are required to be two-stage type, they may be electric type; or they may be electronic type, actuating one or two relays, as required.

3) If sequence control is required, an adjustable dead band shall be provided between modes.

4) In each description which follows, where a change of mode is specified, such as, but not limited to, activating or deactivating dampers or coil valves, start-up, or by limit controllers of

any sort, the control signal to the controlled devices shall have a means to provide time delay (approximately 60 seconds-adjustable) in the action of the controlled device to prevent hunting. The exception to this is the operation of any device when either a firestat or other safety device is activated. Any exception shall be caused to occur quickly but without damage to the controlled device or equipment.

5) Chilled water control valves shall fail open to coil. Hot water valves shall fail open to bypass. Outside air dampers shall fail closed.

6) All safeties shall be wired for equipment shutdown independently from the EMCS to insure that safeties are fully functional in the manual mode of operation. The EMCS shall only monitor safety devices.

2. Type of Equipment

a. Specifications for equipment and devices are covered in PART 2 - PRODUCTS and more detailed features of operation and methods are included on the control diagrams on the drawings.

b. Any necessary relays, switches, or other devices required to accomplish the operating sequences and functions described shall be provided under this Section, whether or not mentioned herein.

3. Identification

Any devices associated with a given item of equipment shall be identified as shown in the schedules on the drawings and shall be shown on the shop drawing submittal with a suffix number which identifies it with that equipment.

1.2 TRAINING

A. The manufacturer shall provide factory-trained instructor to give full instruction to designated personnel in the operation of the system installed. Instructors shall be thoroughly familiar with all aspects of the subject matter they are to teach. The manufacturer shall provide all students with a student binder containing product specific training modules for the system installed. All training shall be held on-site during normal working hours of 8:00 am to 4:30 PM weekdays.

B. Provide four (4) hours of training for Owner's designated operating personnel. Training shall include:

Explanation of drawings, operations and maintenance manuals

- Walk-through of the job to locate control components
- Operator workstation and peripherals
- DDC controller and ASC operation/function
- Operator control functions including graphic generation and field panel programming
- Operation of portable operator's terminal
- Explanation of adjustment, calibration and replacement procedures
- Student binder with training modules

C. Since the Owner may require personnel to have more comprehensive understanding of the hardware and software, additional training must be available from the Manufacturer. If the Owner requires such training, it will be contracted at a later date.

PART 2 - PRODUCTS

2.1 CONTROLS AND DEVICES

A. General

1. Actuators shall be sized to operate their appropriate dampers or valves with sufficient reserve power to provide smooth modulating action or two-position action as specified.
2. Firestats shall have manual reset.
3. Controllers for sensors shall have adjustable sensitivity.

B. Devices

1. Temperature Sensors

a. Digital room sensors shall have LCD display, day / night override button, and setpoint slide adjustment override options. The setpoint slide adjustment can be software limited by the automation system to limit the amount of room adjustment.

Temperature monitoring range	(+20/120°F -13° to 49°C)
Output signal	Changing resistance
Accuracy at Calibration point	$\pm 0.5^{\circ}\text{F}$ ($\pm 0.3^{\circ}\text{C}$)
Set Point and Display Range	55° to 95° F (13° to 35°C)
Liquid immersion temperature:	
Temperature monitoring range	+30/250°F (-1°/121°C)
Output signal	Changing resistance
Accuracy at Calibration point	$\pm 0.5^{\circ}\text{F}$ ($\pm 0.3^{\circ}\text{C}$)

Duct (single point) temperature:	
Temperature monitoring range	+20/120°F (-7°/49°C)
Output signal	Changing resistance
Accuracy at Calibration point	$\pm 0.5^{\circ}\text{F}$ ($\pm 0.3^{\circ}\text{C}$)
Duct Average temperature:	
Temperature monitoring range	$+20^{\circ} \pm 120^{\circ}\text{F}$ ($-7^{\circ}/+49^{\circ}\text{C}$)
Output signal	4 – 20 mA DC
Accuracy at Calibration point	$\pm 0.5^{\circ}\text{F}$ ($\pm 0.3^{\circ}\text{C}$)
Sensor Probe Length	25' L (7.3m)
Outside air temperature:	
Temperature monitoring range	$-58^{\circ} \pm 122^{\circ}\text{F}$ (-50°C to 50°C)
Output signal	4 – 20 mA DC
Accuracy at Calibration point	$\pm 0.5^{\circ}\text{F}$ ($\pm 0.3^{\circ}\text{C}$)

2. Energy Management System - Computrols.

3. Control Valves (all control valves shall have electric actuators).

- a. Electric Control
- b. Rangeability 40:1
- c. Flow Characteristics Modified. Equal percentage
- d. Control Action Normal open or closed as selected
- e. Medium Steam, water, glycol
- f. Body Type Screwed ends 2" and smaller,
flanged Valves 2½" and larger
- g. Body Material Bronze
- h. Body Trim Bronze
- i. Stem Stainless Steel
- j. Actuator 0-10 VDC or 4-20 MA
24 VAC/120VAC

k. All automatic temperature control valves in water lines shall be provided with Characterized throttling plugs and shall be sized for a pressure drop of 5 psi. Control valve actuators shall have manual adjustment lever to allow for positioning of the valve upon actuator failure.

4. Air Flow Monitoring Stations

Provide Ebtron Gold Series Multi-point thermal dispersion airflow measuring stations. Provide with local LCD display of flowrate. The installation shall be in strict conformance with Ebtron's requirements for probe placement and other installation details.

2.2 SYSTEM GRAPHICS

Provide an individual graphic for each air handling system provided under this project into the existing Operator Workstation at the West Bank Administration Building. Also provide an individual graphic for the 1) hot water system, 2) chilled water system, and 3) each VAV box. Graphic shall display fan, coils, dampers, and all sensing and control points associated with the particular unit. Program floor plan type graphics of this project showing the location of controlled equipment to allow full graphic penetration of the EMCS system data via the system mouse.

2.3 ELECTRICAL WORK

A. Materials shall be new and shall be Underwriters Laboratories labeled or listed.

B. Wiring in equipment rooms and wiring in inaccessible spaces shall be contained in metallic raceways. All wiring for higher than 70 volts shall be contained in metallic raceway regardless of location. Raceways shall meet the requirements of DIVISION 16 - ELECTRICAL. Wiring above lay-in ceilings shall be U.L. rated for use in plenums.

C. Control or signaling wiring shall not be installed in raceways with power wiring.

D. Wiring for 115 volts and higher shall be copper #12 AWG or larger. Wiring type, insulation, etc. shall meet the requirements of DIVISION 16 - ELECTRICAL.

E. Wiring less than 115 volts shall be copper. Wire size, type and insulation shall be selected to suit the application.

F. Wiring and raceways for line voltage interlocking shall be work of this Section. Voltage shall be 115 volts, 1 phase, 60 hertz. Provide transformers where required.

G. Control and signaling wiring and raceways between equipment specified under this Section shall be work of this Section.

H. A source of power may be indicated under DIVISION 16 - ELECTRICAL, for activating control devices where power for controls does not originate at the control transformer furnished with the starter or control panel. Work of this Section shall include wiring required for controls from this source. If additional 120 volt power is required, it shall be obtained from spare breakers at a location approved by the Architect. The cost of installation of raceways, wiring, etc. shall be included as work of this Division. The Contractor shall review electrical drawings prior to bidding.

I. Control power for each VAV box shall be provided as work of this section. Provide 120 volts to each VAV box. Provide 120 volt disconnect and a control power transformer at each VAV box.

2.4 CONTROL DAMPERS

A. Dampers shall be specifically designed to control air flow in heating, ventilating and air conditioning systems. Dampers shall be installed where indicated on the drawings or otherwise specified. Dampers shall be of the low leakage type rated at a maximum leakage of 3 cfm per square foot at 1 inch W.G. Blade type shall be opposed or parallel as required.

B. Frames shall be constructed from 13-gauge galvanized sheet steel, roll formed into channels and welded for maximum strength. Safing strips shall be added to the top, bottom and/or sides to achieve sizes in 2 inch increments.

C. Blades shall be constructed from two roll formed sheets of 22-gauge galvanized sheet steel, spot welded together for extra strength to withstand high velocities and static pressures. Blade pins shall be square zinc plated steel.

D. Bearings shall be oil impregnated plastic or sintered bronze. Blade end seals shall be self-compensating stainless steel. Seals shall be easily replaceable if damaged.

E. Stops shall be provided to prevent over rotation at both the open and closed positions. The linkage which interconnects the damper blades shall be housed in the side channels of the frame to reduce air noise and friction.

F. Actuator shall be properly sized to operate the damper and mounted in an accessible location.

PART 3 - EXECUTION

3.1 GENERAL

The installation shall include calibration of instruments, drawings, supervision, adjusting, validating and checkout necessary for an operational system.

The entire control system shall be installed by skilled personnel under the direction of experienced engineers, each of whom shall have been properly trained and qualified for this work.

3.2 MOUNTING HEIGHTS

A. Any control devices installed in public areas shall be located to properly sense temperature, humidity, etc. and shall be located at ADA height.

B. Any control devices installed in equipment rooms shall be located at eye level so that it may be visually inspected and adjusted, unless otherwise indicated on the drawings or as required to accomplish the control sequence.

3.3 ELECTRICAL WORK

A. Power for control devices shall be obtained from one of the following sources:

1. A spare dedicated circuit in a panelboard approved by the Engineer.
2. A step-down transformer connected to an equipment power source. The control power source must be intended for control devices associated only with that piece of equipment or system.

B. Firestats for three phase fans shall be mounted and electrically wired into the holding coil circuit of the respective starter or contactor. Pressure switches, relays, etc. shall also be wired as work of this Section.

C. The entire wiring system shall be color coded throughout. The color code shall be established on the control diagrams. Where necessary, conductors may be spliced in junction boxes but the splice shall be of the proper size for the class and type of circuits. Insulation shall be type TW, THW, or TEF to suit the class and type of circuit.

3.4 OPERATOR INSTRUCTION

A. When acceptable performance of the system has been established, the Contractor shall provide a minimum of eight hours of on-site operator instruction to the Owner's operating personnel. Operator instruction during normal working hours shall be performed by a competent control system representative.

3.5 GUARANTEE

Components, parts and assemblies shall be guaranteed against defects in material and workmanship for a period of one year after acceptance.

3.6 SCOPE OF WORK / SEQUENCE OF OPERATION

General Scope

The project includes replacement of the two air cooled chillers, the boiler, chilled water pumps, hot water pumps, electric duct heaters, and some ductwork. Replace controls on all equipment and ductwork being replaced. Also fully re-commission existing energy management and control system to meet sequence of operation described below.

Demolition

Demolish existing controls associated with equipment being demolished including wiring, raceways, tubing, accessories and appurtenances.

Routing of Wiring and Raceway

Do not route wiring through the firing range or through the bullet trap area. These areas are exposed to gun fire. All wiring shall be routed through the open space areas around the perimeter of the firing range and bullet trap area.

Time Delay for Dampers

Where dampers are opened and closed as fans are started and stopped, provide an adjustable time delay to allow dampers to open before fans are energized.

Graphic Displays

Color graphic floor plan displays, and system schematics (for each piece of mechanical equipment) shall be provided as a part of this contract.

Graphical displays that to be provided as a part of this scope shall at minimum consist of the following:

- A floor plan of each level of the building showing all HVAC equipment of the respective floor (including all HVAC equipment). Choosing a piece of equipment within that floor with the mouse will penetrate to a detailed graphic and flow diagram graphic of the chosen equipment. The equipment graphic shall include all control and monitoring points and shall allow for adjustment to all control points and all setpoints.

HVAC System Control Panel

Provide an HVAC system control panel for manual control of HVAC systems. The following shall be included in the cover of the panel:

- Four-position switch for Range HVAC System 1.
- Four-position switch for Range HVAC System 2.
- Four-position switch for Range HVAC System 3.
- Hand/Off/Auto switch for Administration Area Unit AHU-10.

In the Auto position, the systems shall be started and stopped from the EMCS.

The chilled water system shall be started whenever any of the systems are manually started from the control panel if outdoor air temperature is above 60° F.

The hot water system shall be started whenever any of the range systems are manually started from the control panel if outdoor air temperature is below 60° F.

Range HVAC System 1

Range HVAC System 1 consists of Air Handling Units AHU-1, 2 and 3 and Electric Duct Heater EDH-1. System 1 shall have two modes of operation (recirculation mode and

ventilation mode). Provide a four-position switch for system 1 on the HVAC system control panel for manual control. Switch positions shall be as follows:

- Position 1 - Off
- Position 2 - Auto (controlled by EMCS)
- Position 3 - Recirculation mode
- Position 4 - Ventilation mode

The recirculation mode is intended to provide heating and cooling during periods when the firing range is not in use. In the recirculation mode, Air Handling Unit AHU-1 (recirculation unit) shall be started, AHU-2 (outside air unit) shall remain off and AHU-3 (exhaust unit) shall remain off.

The ventilation mode is intended for all periods when the firing range is in use. In the ventilation mode, Air Handling Units AHU-1 (recirculation unit), AHU-2 (outside air unit) and AHU-3 (exhaust unit) shall be started.

Range HVAC System 2

Same as System 1 except that System 2 consists of recirculating Air Handling Unit AHU-4, outside Air Handling Unit AHU-5, exhaust Air Handling Unit AHU-6 and Electric Duct Heater EDH-2.

Range HVAC System 3

Same as System 1 except that System 3 consists of recirculating Air Handling Unit AHU-7, outside Air Handling Unit AHU-8, exhaust Air Handling Unit AHU-9 and Electric Duct Heater EDH-3.

Air Handling Unit AHU-1 (AHU-4 and AHU-7 similar)

Air Handling Unit AHU-1 is a heating and cooling unit with a chilled water cooling coil, cooling coil face and bypass dampers and an electric duct heater.

The Unit shall be started and stopped by the EMCS acting through the Auto position of the Hand/Off/Auto switch on the cover of its motor starter. Starting the unit shall energize associated controls. Provide a current sensing relay to monitor supply fan run status from the EMCS.

Provide a supply and a return air duct smoke detector. Interlock the detectors to de-energize AHU-1 and associated outside air unit AHU-2 if products of combustion are detected.

Provide an averaging type low limit temperature controller in the mixed air stream at the filter rack. This low limit temperature controller shall de-energize AHU-1 and 2, annunciate an alarm at the EMCS, and close the outside air damper if mixed air temperature drops

below 38° F (field adjustable). The low limit temperature controller shall have a manual reset.

Air Handling Unit AHU-1 is 21,600 CFM; however, the cooling coil is sized for a maximum air flow of 7,200 CFM. Face and bypass dampers shall be configured to limit cooling coil air flow to 7,200 CFM in the full cooling mode. Coordinate with the testing and balancing subcontractor to confirm limits.

Provide a space temperature sensor. On a call for cooling, modulate face and bypass dampers to maintain space temperature.

Provide a modulating three-way chilled water control valve. Provide an averaging type cold deck temperature sensor immediately downstream of the cooling coil. The cold deck temperature shall be maintained at 55° F whenever there is a call for cooling from the space temperature sensor. If there is no call for cooling, the chilled water control valve shall bypass the coil. The cold deck setpoint shall be adjustable from the EMCS.

On a call for heating from the space temperature sensor, override leaving air controls of outside Air Unit AHU-2 and modulate the hot water control valve for the preheat coil of AHU-2 to maintain space temperature. During periods when AHU-2 is not operational, when the hot water system is not operational or when AHU-2 cannot provide sufficient heating, modulate SCR controls of Electric Duct Heater EDH-1 to maintain space temperature.

Provide an averaging type supply air temperature sensor downstream of EDH-1 to monitor supply air temperature from the EMCS.

Air Handling Unit AHU-2 (AHU-5 and 8 similar):

Air handling unit AHU-2 is a 100% outdoor air unit equipped with heat pipe energy recovery installed across the chilled water cooling coil. The heat pipe arrangement is passive without controls. The unit includes a hot water heating coil in the preheat position.

The unit shall be started and stopped by the EMCS acting through the auto position of the hand-off-auto switch on the cover of its motor starter. Starting the unit shall open the outside air damper and shall energize associated controls. The outside air damper for AHU-2 shall be modulated to maintain firing range static pressure differentials. See "Space Pressurization Controls". The outside air damper shall close whenever the unit is de-energized.

Provide a current sensing relay on the fan motor power lead for EMCS monitoring of fan status.

Provide a supply air duct smoke detector. Interlock the smoke detector to de-energize the unit if products of combustion are detected.

Provide an averaging type low limit temperature thermostat (freezestat) downstream of the preheat coil. The low limit thermostat shall de-energize the unit, close the outside air damper and annunciate a EMCS alarm if air temperature drops below 40 degrees F (field adjustable). The low limit temperature controller shall have manual reset.

Provide a modulating three-way hot water control valve. Provide an averaging type temperature sensor immediately downstream of the preheat coil. The hot water control valve shall be modulated to maintain 68 degree F air leaving the preheat coil. The preheat coil temperature setpoint shall be adjustable through the EMCS.

Provide a modulating three-way chilled water control valve. Provide an averaging type temperature sensor immediately downstream of the chilled water coil (between the chilled water coil and the reheat heat pipe coil). The chilled water control valve shall be modulated to maintain 55 degree F air leaving the chilled water coil whenever outdoor air temperature is above 60 degrees F. The chilled water coil temperature setpoints shall be adjustable through the EMCS.

Provide averaging type supply air temperature sensor monitored by the EMCS.

Air Handling Unit AHU-3 (AHU-6 and 9 similar)

Air Handling Unit AHU-3 is a HEPA filter exhaust unit with constant volume controls. An air flow monitoring station is included on the air handling unit schedule. Coordinate trades.

The unit shall be started and stopped by the EMCS acting through the auto position of the Hand/Off/Auto switch on the cover of its motor starter. Starting the unit shall open the inlet air damper and energize associated controls. The inlet air damper shall close when the unit is de-energized.

Provide a high limit thermostat (fire stat) at the fan inlet to de-energize the unit if entering air temperature exceeds 135° F.

Modulate the inlet air damper to maintain constant air flow as filter pressure drops vary due to filter loading.

Space Temperature Sensors (Thermostats)

Space temperature sensors shall have adjustable setpoint dial and an override pushbutton. Space temperature shall be monitored by the EMCS. Space temperature setpoint from the space temperature sensor shall be limited by EMCS settings. The override pushbutton is to override night setback and trigger the occupied mode of operation. The units energized from the override button on each space temperature sensor and the length of the override period triggered from each space temperature sensor override button shall be programable from the EMCS. The intent is to allow for full control of space temperature setpoint and night setback override from space temperature sensors in private areas and similar spaces but to allow limited control of setpoints from space temperature sensors in public areas.

Space Pressurization Controls

Provide a differential pressure sensor between the firing range and open area Room 125. The outside air dampers at AHU-2, 5 and 8 shall be modulated to maintain a negative pressure of 0.05 inches water gauge in the firing range with respect to the open area. The differential pressurization setpoint shall be adjustable through the EMCS. Dampen controls to minimize the effects of the opening and closing of doors.

VAV Air Handling Unit AHU-10

With the hand-off-auto switch in the cover of the variable speed drive in the auto position, the fan shall be started and stopped by the EMCS. Provide a current sensing relay on the fan motor lead to monitor fan status from the EMCS.

When the air handling unit is de-energized, the outside air damper shall close. When the unit is started, the outside air damper shall open.

Provide a supply air duct smoke detector. Interlock the detector to de-energize the unit if products of combustion are detected.

Provide an averaging type temperature sensor (freezestat) with manual reset sensing mixed air temperature at the inlet of the cooling coil. The unit shall be de-energized if mixed air temperature drops below 40 degrees F. Also provide an averaging type sensor for EMCS monitoring of mixed air temperature.

Provide a high limit static pressure switch at the supply air discharge of the unit. Interlock the high limit switch to de-energize the fan if discharge static exceeds 3.5" W.G.

Provide an analog airflow monitoring station in the outside air stream to monitor flowrate from the EMCS. Mixing box dampers shall be modulated in sequence to maintain constant outside airflow as supply airflow varies. Outside air flowrate for occupied and unoccupied modes shall be fully adjustable from the EMCS.

Provide an analog static pressure sensor in the supply air trunk ductwork 2/3 down stream in the longest run of ductwork. The supply fan variable speed drive shall be modulated to maintain constant static pressure at the sensor location. The static pressure setpoint shall be field determined during the HVAC system testing and balancing procedure. The location and static pressure setpoint shall be documented on the record drawings.

Provide an averaging type supply air temperature sensor and a three-way modulating chilled water control valve. The control valve shall be modulated to maintain 55° F supply air temperature setpoint. The supply air temperature setpoint shall be adjustable through the EMCS.

VAV Boxes

VAV boxes shall be equipped with full DCC control. A factory mounted control power transformer and multi-point inlet velocity sensor is to be provided by the box manufacturer. All other box controls shall be furnished under this section but factory mounted by the box

manufacturer. Fully coordinate trades prior to bidding to provide complete and functional control system without duplication between trades.

VAV box space temperature sensors shall have adjustable setpoint dial and an override pushbutton. Space temperature shall be monitored by the EMCS. Space temperature setpoint from the space temperature sensor shall be limited by EMCS settings. The override pushbutton is to override night setback and trigger the occupied mode of operation. The length of the override period for each space thermostat shall be adjustable from the EMCS.

The EMCS shall monitor space temperature and primary air CFM for each box. Maximum cooling, minimum cooling and heating CFM setpoints shall be adjustable from the EMCS.

On a call for cooling, the VAV box shall be modulated from minimum to maximum CFM settings to maintain space temperature. On a call for heating, the VAV box shall open to the heating CFM set point and electric heat shall be staged to maintain space temperature.

Circulating Pumps (Typical of two chilled water pumps, and two hot water pumps)

Each pump shall be started and stopped by the EMCS acting through the auto position of the HOA switch on the cover of the pump motor starter.

Provide a current sensing relay on the pump power lead at each pump for EMCS monitoring of pump status.

Pumps shall also start for freeze protection whenever outdoor temperature drops below 40 degrees F.

Hot Water Boiler B-1

Provide a HOA switch at the boiler control panel. The hot water boiler shall be started and stopped from the EMCS through the auto position of the HOA switch. Provide a hot water flow switch at the boiler to lock-out boiler operation until hot water flow is proven.

Hot Water supply and return temperatures shall be monitored by the EMCS.

Chiller CH-1 (CH-2 similar)

Interface the chiller control panel to provide for start/stop, chilled water supply temperature reset and monitoring of chiller safety status from the EMCS. Provide a chilled water differential pressure switch to lock-out chiller operation until both chilled water flow is proven. All control interlocks shall be in conformance with the chiller manufacturers published recommendations.

Provide EMCS monitoring of chilled water supply temperature, chilled water return temperature, and run status for the chiller.

Provide EMCS reset of chilled water temperature setpoint.

Ductless Split Systems

Space thermostats are indicated in the equipment schedules. Provide field wiring and controls in accordance with the equipment manufacturer's requirements and recommendations.

The ductless split indoor unit shall be started and stopped from its 7-day programable space thermostat. The thermostat shall have independent occupied/unoccupied setpoints. Cooling and heating shall be staged by the space thermostat. Change-over from heating mode to cooling mode, and vice versa shall be in strict conformance with the equipment manufacturer's recommendations.

Space thermostats shall be interlocked so that they can be "grouped" to share setpoints and schedules. Groups setting shall be controlled from the thermostats. See manufacturer's literature for the thermostat which is indicated in the equipment schedules.

The ductless split systems shall be provided with BACnet EMCS interface for integration with the building EMCS. All unit setpoints, scheduling and monitoring shall be mapped to be controlled and monitored by the EMCS.

Provide programming, field wiring, mounting of devices as well as any and all other work for a fully functional system. Fully coordinate the work with the successful equipment manufacturer's before submitting control shop drawings.

Exhaust Fan EF-1, 2 and 3

Exhaust Fans EF - 1, 2 and 3 shall be started and stopped from a wall switch.

Exhaust Fan EF-4

Exhaust Fan EF-4 shall be interlocked to start and stop with Air Handling Unit AHU-10.

Outdoor Air Conditions

The EMCS shall monitor outdoor air temperature and humidity.

EMCS Controls and Monitoring

All EMCS system control and monitoring points indicated in the sequences of operation and all points required to achieve control sequences indicated shall be provided.

Additional Controls

Provide controls for all HVAC system equipment and components for a complete and fully functional building HVAC system. Where a specific sequence of operation is not specified, provide controls in accordance with good engineering practices similar in type and function of the sequences included herein.

- END OF SECTION -

SECTION 260000 - ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the contract, including general and special conditions and general requirements, apply to the work specified in ELECTRICAL DIVISIONS.

B. Separation of Electrical Divisions into Sections is for convenience only and is not intended to establish limits of work. Sections are as follows:

26 0000	ELECTRICAL GENERAL PROVISIONS
26 0500	ELECTRICAL BASIC MATERIALS AND METHODS
26 2000	ELECTRICAL SERVICE AND DISTRIBUTION
26 4100	LIGHTNING PROTECTION
26 5000	ELECTRICAL LIGHTING
27 0500	COMMUNICATIONS SYSTEMS
28 3100	FIRE ALARM SYSTEM

1.2 SCOPE

A. The work under this Section includes furnishing and installing wires, conductors, cables, conduit and conduit fittings, underground non-metallic conduit, wiring devices, junction and outlet boxes, circuit breakers, fuses, relays, contactors, safety switches, lighting fixtures, automatic lighting shut-off devices, grounding connections, raceways for data outlets, raceways and wiring for voice/data outlets, fire alarm system, lightning protection system, and other equipment specified or necessary for a complete installation. The work also includes making building modifications if necessary to get these items to the locations for installation.

B. Removal of existing electrical equipment not being reused.

1.3 CUTTING AND PATCHING

A. Contractor shall do his work in such a way to avoid cutting where possible. Holes cut shall be patched in a suitable manner and shall be refinished to match the existing finish. Holes cut in exterior walls shall be patched, flashed, and completely waterproofed. Contractor shall patch and/or repair walls, ceilings, and floors where existing

equipment is removed.

B. Cutting and patching for the work of this Division shall be in accordance with the requirements of the General Conditions. Openings around conduit penetrations shall be sealed. At exterior walls, these shall be completely waterproofed.

C. Work of this Division shall include providing information for any required openings to those responsible for concrete slabs and other concrete members.

D. Field cut openings in concrete shall be located to avoid the reinforcing. These areas shall be scanned (x-ray or other suitable method) to obtain locations of reinforcing and other obstructions. Locations shall be subject to approval of those responsible for DIVISION 3 - CONCRETE.

E. No structural members shall be field cut or pierced without the approval of the Architect.

F. Inserts in slabs and beams for fastening work shall be cast in place wherever possible. If additional inserts are required after concrete is placed, drilled type shall be used.

G. For post-tensioned slabs and beams, inserts for fastening work shall be cast in place wherever possible. If additional inserts are required after concrete is placed, drilled type shall be used. Drilling shall not penetrate the post-tensioning tendons. Powder driver fasteners shall not be used.

H. Grouting shall be provided around raceway penetrations through concrete floors equal to the fire rating of the floor using non-shrinking waterproof grout to inhibit water from leaking through the floor.

1.4 DRAWINGS

A. Outlets shown on electrical drawings are located approximately only. Refer to [architectural drawings for necessary dimensions. Refer to architectural, structural, and mechanical drawings as well as] equipment manufacturer's shop drawings and rough-in drawings, and adjust work accordingly to provide a coordinated installation. Contractor shall install fire alarm devices as near as possible to the locations indicated on the drawings but shall move them as necessary to avoid conflicts with existing equipment and to be located sufficiently away from hot objects.

B. Smoke detectors and heat detectors shall be located so that the maximum distance between detectors is 30'-0", and the maximum distance from walls is 15'-0". Smoke detectors shall also be located within 5' of smoke doors held open. Locations shall conform to other restrictions of NFPA 72 to include the requirement that smoke detectors be kept at least 36" away from HVAC grilles. Contractor shall plan for contingencies in connection therewith to include providing additional smoke detectors and heat detectors.

C. Visual signal unit and audiovisual signal unit locations shall be adjusted as necessary to avoid conflicts with other equipment.

D. Visual signal unit and audiovisual signal unit locations shall be adjusted as may be necessary to meet NFPA 72 Paragraphs 18.5.5.4 and 18.5.5.5.

1.5 LAWS AND PERMITS

A. The National Electrical Code (2020) and Louisiana Building Code for State Owned Buildings, State, Parish, City and local building codes shall be considered a part of these specifications, and pertinent articles will not be repeated herein. These codes shall establish the minimum acceptable criteria where more stringent requirements have not been defined in these specifications and/or drawings.

B. The Contractor shall apply for permits and pay inspection fees incidental to electrical work.

C. No work shall be concealed until approved by the local inspector and local regulations shall be adhered to.

D. Upon completion, a certificate of approval from the appropriate regulatory agency shall be furnished to the Architect.

E. Where equipment is located at exterior of buildings or structures, the minimum elevation for their installation shall be the greater of 36" above curb or 12" above the FEMA Base Flood Elevation. Contractor shall obtain this flood elevation from a licensed surveyor and pay the cost associated therewith. Contractor shall provide documentation to the Architect to confirm that this requirement has been met.

1.6 VISITING SITE

The bidder shall visit the site of proposed work so that he may understand the facilities, difficulties, and restrictions attending the execution of the contract. He will be allowed no additional compensation for failure to be so informed.

1.7 INTERRUPTION OF SERVICES

Services in existing building(s) are to be kept in operation at all times, except when specific permission is given to do otherwise. Before any services are interrupted, arrangements shall be made with the occupants to do this work at a time most convenient to them. This procedure may involve working at night, on Saturday or Sunday, or at a special time of the year, with the length of time of the interruption agreed upon in advance. Once any service is interrupted, work to restore the service in the shortest possible time shall be on a continuous basis unless temporary service is provided or approval is obtained from the Owner to do otherwise. Any temporary services required shall be work of this Division. Allowance shall be made in the Contractor's bid for the cost of any overtime work in this connection.

1.8 GUARANTEE

The Contractor shall guarantee materials and workmanship for one year after final acceptance of entire project unless a longer guarantee is indicated hereinafter for specific equipment.

PART 2 - PRODUCTS

2.1 MATERIAL AND WORKMANSHIP

Equipment and materials shall be new and shall be listed by Underwriters Laboratories, Inc. in categories for which standards have been set by that agency. Whenever two or more of the same product are indicated, they shall be of the same manufacturer. [In particular, panelboards and switchboards shall be of the same manufacturer.] Methods of installation shall be in full accord with the latest and best electrical and mechanical engineering practices.

2.2 SUBSTITUTIONS

A. Names of manufacturers or catalog numbers are mentioned herein in order to establish a standard as to design and quality. Other products similar in design and of equal quality may be used if submitted to the Architect and found acceptable by him. Refer to General Conditions and other portions of the specifications for additional information.

B. When the Contractor elects to use an acceptable alternate manufacturer's equipment, the Contractor shall be responsible to coordinate the change with the trades affected. The Contractor shall also pay for any additional work required under this Division as well as any other Division if the alternate equipment is used.

C. Lighting fixture substitutions shall also be similar in appearance, construction and photometrics (photometric information shall be based on independent laboratory reports) to specified lighting fixtures.

D. If required by Architect because of substitutions, the Contractor shall submit for approval 1/4" scale working drawings of equipment areas with both plan and section views.

2.3 SUBMITTALS

A. Within 30 days after award of contract, the Contractor shall submit for review six copies of descriptive literature or shop drawings for the following material which he proposes to use:

Wiring devices and
plates.
Automatic lighting shut-off

devices.
Lighting control systems.
Fuses.

Safety switches.
Lighting fixtures.
Fire alarm system.
Lightning protection
system.

Fault current & protective
device coordination study.
Voice/data wiring
and raceway system.

B. In addition, the name of the manufacturer of conduit, E.M.T., and conductors to be used shall be submitted for review. Contractor is reminded that 600V conductors shall be rated for wet locations at 90 degrees C.

C. Where applicable, submissions shall include installation drawings and brochures showing locations, methods of anchoring, connections to work of others, wall or ceiling conditions at each particular installation and special floor mounting conditions.

D. Submissions shall be identified with project name, equipment name and number (if assigned a number) same as the name and number indicated on the drawings; shall be properly marked to show model numbers and any accessories being furnished; and shall have the Contractor's stamp showing he has reviewed the submittal and found it to be in accordance with the specifications and drawings. Items of Division 16 to be submitted shall be submitted in one package.

E. Submittals for voice/data wiring and raceway systems (and CATV systems) shall include shop drawings to show the raceway routings, and a riser diagram to show wiring, quantities of terminal blocks, patch panel ports, splitters for CATV, data switch ports, etc. An elevation layout of each rack shall be provided to show all equipment including Contractor-provided equipment and Owner-provided equipment.

F. Submittals which do not comply with the above will be returned without review, for resubmittal.

PART 3 - EXECUTION

3.1 EXCAVATING AND BACKFILLING

A. Do excavating and backfilling required for the work of this Division. Removal of obstructions, hidden or otherwise, shall be part of this work. Backfill shall be river sand. Backfilling shall be done in two lifts each thoroughly tamped. Surplus earth shall be removed.

B. Before excavating or trenching, locate and stake out existing underground utilities which may be adversely affected by this work. Work shall be performed in a manner to avoid damage to existing utilities. Repair or replace, at no expense to Owner, any utilities damaged by him. Call 1-800-272-3020 per Louisiana Statutes.

3.2 RECORD DRAWINGS

At the completion of the work, unless noted otherwise in the General Conditions, mark-up a set of prints in a neat and understandable manner to show significant changes made during construction. Wiring and raceways installed shall be indicated (routings, wire size and quantity) on the record drawings even if not indicated on the contract drawings. Underground raceways and wiring shall be measured and dimensioned from above-grade structures. Copies of panelboard circuit directories shall be included. These prints shall be scanned and a PDF file (on a CD-ROM), as well as two sets of prints made from the PDF, shall be provided. Final payment will be withheld until these drawings are furnished to the Engineer. The Contractor shall pay for the reproduction costs. [These drawings will be used by the Engineer to provide this information to the Owner.]

3.3 OPERATING INSTRUCTIONS

A. Before final acceptance, prepare and deliver to the Architect two bound copies of operating instructions, which shall include:

1. Description of major components of power systems and each special system, including the function of major items.
2. Detailed operating instructions and instructions for making routine minor adjustments.
3. Routine maintenance operations.
4. Manufacturer's catalog data and service instructions and parts list for each piece of operating equipment.
5. Final reviewed submittals (including review comments).

B. Instruct Owner in the care and operation of equipment and provide the services of a competent mechanic for this purpose.

C. Literature shall be substantially bound in a suitable number of volumes so as to permit heavy usage and shall include wiring diagrams, fabrication drawings and other information as may be required.

3.4 MECHANICAL EQUIPMENT

A. Unless indicated otherwise, magnetic starters (including variable speed drives) will be furnished under other Divisions for installation under this Division.

B. Overload elements in starters shall be selected according to actual motor nameplate full load current. Responsibility for this coordination shall lie with the Division under which the particular starter is furnished.

C. Unless indicated otherwise, power disconnect switches and single speed manual starting switches shall be furnished and installed under this Division. Where

combination magnetic starters are provided as work of another Division, the associated disconnect switch will be furnished as work of that Division.

D. Where Division 15 schedules indicate that equipment is furnished with a disconnect, the disconnect shall be installed and connected as work of Division 16.

E. Whether indicated on drawings or not, circuits to 480V, 3-phase VAV boxes shall include a neutral conductor.

F. Refer to DIVISION 15 - MECHANICAL, and to mechanical drawings for any additional electrical power work required.

3.5 WORK RELATED TO EQUIPMENT NOT FURNISHED AS WORK OF THIS DIVISION

Unless specifically indicated otherwise, any required electrical services for and required electrical connections to items shown on the architectural drawings or specified to be furnished in other Divisions of specification or by Owner shall be electrically connected as work of this Division.

3.6 PAINTING

Painting , including painting of exposed conduit is specified under DIVISION 9 -FINISHES. Damaged surfaces of factory-finished items, however, shall be repaired to the satisfaction of the Architect as the work of this Division.

3.7 PROTECTION OF WORK

Protect the equipment, fixtures, and work from damage. Damaged work will be rejected and replaced at the expense of the Contractor. Lighting fixtures, panels and similar equipment shall likewise be protected from damage and from the weather. Provide adequate and proper storage facilities for such items during the progress of the work.

3.8 BUILDING CODE RESTRICTIONS

Contractor shall assure that he does not install electrical equipment including raceways in or through areas restricted by the building codes. These areas include I.T communication rooms in Health Care Facilities, fire pump rooms, elevator shafts, and stairs.

3.9 EXISTING WORK

A. Remove existing lighting fixtures from areas affected by new construction and from areas to be relighted. After completion of work in a given area, the Contractor shall reinstall the existing lighting fixtures or install new lighting fixtures as indicated.

B. Where existing ceilings are being removed, provide new supports for

raceways, outlets, junction boxes, and other electrical items which are to remain and which depend upon the existing ceiling suspension system for support. The new supports shall be attached to the structure/slab above.

C. Existing outlets not to be reused shall be removed unless directed otherwise. Where outlets are indicated to remain as junction boxes, wall outlets shall be provided with blank device plates of the type hereinafter specified and ceiling outlets shall be provided with Yorkville #76 covers where fixture studs exist and #176 where there are no studs.

D. Where new wall or ceiling finishes are applied, existing equipment and cover plates for wiring devices, junction boxes, telephone outlets and data outlets, etc., shall be removed and reinstalled. Provide extension rings on outlets to remain, where necessary. New cover plates shall also be installed on boxes that do not contain cover plates. Existing outlets, boxes, etc., are not shown on the drawings; bidder shall visit the site to locate these.

E. Existing exposed conduit and other electrical equipment not to be reused shall be removed. Existing conduit not to be reused and located in accessible attic spaces also shall be removed.

F. Existing conduits in good condition (and of the type and size required) may be reused. Existing conductors, wall switches and receptacles which are required to be removed, unless otherwise individually indicated, shall not be reused.

G. Electrical equipment removed and not to be reused shall be stored in one location on the site; any equipment and material which the Owner does not wish to retain shall become the property of the Contractor and shall be removed from the site by him.

H. Where apparent routings of existing raceways are indicated, it is not possible to guarantee that these routings are correct. The Contractor shall allow for contingencies.

I. Where existing raceways are indicated to be reused, it is not possible to guarantee that the existing raceways are in suitable condition to be reused. Before conductors are installed in existing raceways, the raceways shall be cleaned out and a try-plug $\frac{1}{4}$ " smaller than the inside diameter of the raceway pulled through to assure continuity. Raceways which are found to be broken, blocked, and/or defective in any way shall have the defective sections replaced or entirely new raceway provided with routing subject to approval of the Architect. The Contractor shall allow for contingencies in connection therewith.

J. Where outlets to remain are fed from outlets in partitions to be removed, or ceilings and walls to which new finishes are to be applied, the Contractor shall provide such new homeruns or other rerouting as may be required by job conditions to insure service to the outlets to remain.

K. Where existing equipment including wiring and raceways is in conflict with work of this project, Contractor shall rework/reroute/relocate this equipment as necessary.

L. Remove existing electrical equipment (including but not limited to fire alarm panels, communication panels, etc.) that might be damaged during construction unless the Owner prefers that this equipment be kept in operation during construction. Reinstall, test and put equipment back in proper working order unless indicated otherwise. The Contractor should (for his protection) test the equipment prior to removal to insure that the equipment operates properly; the Owner should be notified in writing of any existing malfunctions.

- END OF SECTION -

SECTION 260500 - ELECTRICAL BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes providing labor, materials and equipment indicated, specified and necessary for a complete and operating electrical system and related systems in accordance with SECTION 260000 - ELECTRICAL GENERAL PROVISIONS.

PART 2 - PRODUCTS

2.1 CONDUIT AND TUBING

A. Rigid steel conduit and electrical metallic tubing shall be manufactured by Allied, Triangle-PWC, Republic, Wheatland, or approved equal. Conduit shall be threaded heavy-wall hot-dipped galvanized (inside and out) steel conduit. Electrical metallic tubing shall have galvanized exterior and galvanized or equivalent plastic coated interior to protect against corrosion.

B. Rigid aluminum conduit shall be manufactured by New Jersey Aluminum, or VAW of America from 6063-T42 extruded Schedule 40 pipe. The interior surface shall be coated with special approved lubricating liner.

2.2 CONDUCTORS

A. Conductors shall be copper.

B. Branch circuit wiring shall be #12 AWG or larger (as required for the particular equipment to be fed) with flame resistant insulation. Conductors #8 AWG and larger shall be stranded. Insulation on branch circuit conductors shall be type THWN-2, unless indicated otherwise or otherwise required by the particular application.

C. Feeds to surface and/or suspended fixtures shall be #12 AWG type THWN-2. Wiring through channels of continuous rows shall be #12 AWG and type THWN-2, or XHHW-2. Recessed fixtures shall be fed with #12 AWG type THWN-2 or type XHHW-2 conductors.

D. Recessed fixtures shall be fed with type SF, PF, or PFF conductors unless complete with prewired outlet box approved for type THWN-2 conductors.

E. Feeders shall be of the size as indicated, with type THWN-2 insulation unless indicated otherwise. However, 2-hour fire rated feeders shall be as specified in Section 260000.

F. Except as may be otherwise indicated, conductors shall be manufactured by Triangle-PWC, American Insulated Wire, Senator, Royal, or approved equal.

G. The electrical system has been designed based on copper conductors.

2.3 OUTLETS

A. All boxes, fittings and supports (including wireways) shall be galvanized steel. However, where these items are located near cooling towers, they shall be stainless steel type.

B. Boxes for concealed wall outlets shall be 4" square by 1½" deep, or larger, with raised device covers, except that 2¾" deep switch boxes may be used, unless noted otherwise, where only one conduit enters a box. Device covers for 4" square boxes in masonry walls which are not plastered or otherwise finished shall be 1" minimum in depth with straight rectangular openings for dry wall type construction. Covers for boxes in sheetrock or wood walls shall be of the same depth as the sheetrock or wood thickness and shall have straight rectangular openings.

C. Where 4" junction boxes are indicated or installed, they shall be complete with raised device covers as hereinbefore specified. Blank plates shall be as specified for devices.

D. Boxes for concealed ceiling outlets shall be 4" octagonal by 1½" deep, or larger. Boxes in plaster ceilings shall have plaster covers. Fixture outlet boxes shall be equipped with fixture studs secured to the boxes. Boxes above lay-in ceilings shall be supported by bar hangers or other suitable means; they shall not be supported by ceiling tiles.

E. Concrete boxes shall be used for fixtures on concrete ceilings.

F. Outlet boxes for exposed work at dry locations [in Mechanical and Electrical rooms (where exposed raceways are installed)] shall be 4" square x 1½" deep or larger with Appleton ½" deep raised surface metal covers to accommodate the devices indicated. For other exposed work at dry locations inside buildings, Bell boxes of similar capacity shall be used, unless surface metal raceway system is specified for these areas. Outlet boxes for exposed work exposed to weather or in damp locations shall be of cast or malleable iron, similar to Crouse-Hinds type FS or FD conduits. Boxes shall have metal covers to accommodate the devices indicated.

G. In walls or ceilings of concrete, tile, or other noncombustible material, boxes and fittings shall be so installed that the front edge of the box or fitting will not set back of the finished surface more than ¼". In walls or ceilings constructed of wood or other combustible material, outlet boxes and fittings shall be set flush with the finished surface. If a fixture canopy or pan is used as an outlet box cover, any combustible wall or ceiling finish between the edge of the canopy and the outlet box shall be covered with

noncombustible material.

H. For conduits 1" and smaller, the following shall be the maximum number of conductors permitted in a box:

<u>Trade Size</u>	<u>Max. No. #12</u>
1-1/2" x 4" octagonal	6
1-1/2" x 4" square	9
1-1/2" x 4-11/16" square	12
2-1/8" x 4-11/16" square	16
2-3/4" x 3" x 2"	6
3-1/2" x 3" x 2"	8

I. Where a fixture stud is installed in box, the number of conductors permitted shall be reduced by one. Where a wiring device is installed in box, the number of conductors permitted shall be reduced by two. A conductor running through the box is counted as one conductor, and each conductor terminating in box is counted as one conductor.

J. Outlet boxes installed flush mounted in stud partitions shall be installed in such a way that boxes between any two studs shall penetrate only one wall face. Outlet boxes that penetrate opposite wall face shall be located between adjacent studs (to reduce noise transmission through walls). Where this cannot be accomplished, putty pads (such as those manufactured by Sound Isolation Company) shall be used.

2.4 WIRING DEVICES

A. Wiring devices shall be as manufactured by P&S/Sierra, Hubbell, Leviton, or Eagle. Comparable catalog numbers of devices furnished shall conform with the following:

1. Duplex receptacles 20A/2 pole, 3-wire, 125 volt, grounding type, -- Hubbell #5362-I. Face shall be nylon or polycarbonate.

2. GFI duplex receptacles 20A/2 pole, 3-wire, 125 volt, GFI, tamper-resistant, weather-resistant, grounding type, -- Hubbell #GFR5362-ITR. Unless noted otherwise, GFI receptacles shall not be used to control downstream receptacles. These shall be used for weatherproof applications, and damp locations.

3. Wall switches 20A/1 pole -- Hubbell #HBL1221-I, or equal.

4. Wall switches 20A, 3-way -- Hubbell #HBL1223-I, or equal.

B. All 20A/2 pole, 3-wire receptacles shall be mounted with a "U" shaped grounding connection at the top, except for weatherproof receptacles, and except for locations where existing receptacles are mounted with "U" shaped grounding connection

at the bottom.

C. Where duplex receptacles are indicated to be located as required for electric water coolers and electronic faucets at sinks/lavatories, they shall be located where indicated on electric water cooler shop drawings and faucet shop drawings. Receptacles for these shall be GFI type. Where electric water coolers are hard wire type, a 20A, 1P toggle switch shall be provided behind the wall access panel in lieu of the receptacle from which concealed wiring in raceway is wired to unit; a dedicated circuit (for one or more of these) shall be provided using a GFI circuit breaker.

D. Where receptacles are located in wet or damp locations, they shall be weather-resistant type to meet NEC 406.9.

E. Unless indicated otherwise, lighting fixtures within each room shall be switched by the wall switch or switches indicated in the room.

2.5 DEVICE PLATES

A. Plates shall be of the one-piece type, P&S/Sierra "S-1 N" line or Slater"SSA" line with #302 (non-magnetic) satin stainless steel finish.

B. Where weatherproof switches are indicated, P&S/Sierra type 302 series WP plates shall be used, unless indicated otherwise on drawings.

C. Where weatherproof receptacles are indicated, metal canopy-type weatherproof covers similar to T&B Red Dot Code-Keeper (UL listed for wet locations at all times) shall be used with the weather-resistant receptacles, unless indicated otherwise on drawings.

D. Use multi-gang plates where switches, receptacles, and/or other devices are grouped.

E. Plates shall be installed with the four edges in continuous contact with finished wall surfaces without the use of mats or similar devices. Plaster fillings will not be permitted. Plates shall be installed with an alignment tolerance of 1/16" from the vertical or horizontal.

F. Plates for devices fed with exposed conduit shall be as hereinbefore specified.

G. Wherever a series of switches or pilot lights and switches are grouped, the plates shall be furnished with suitable factory engravings (black filled). Where engraving of dimmer switch plates is impractical, engraved phenolic strips may be installed. Engravings shall indicate function/location names not subscript shown on drawings (names shall be approved by Architect).

H. Device plates shall not be installed until painting is completed. Device plates

having paint on their surfaces, or having their finish marred by use of paint remover, shall be replaced at no additional cost to the Owner.

2.6 SAFETY SWITCHES

A. Safety switches shall be of the quick-make, quick-break visible blade-knife switch type. They shall be of the fused or nonfused type as required. Fused switches shall have positive pressure fuse clips. Heavy duty switches shall be fully interlocked, with provision to neutralize the interlock by a screw driver while under load without interrupting the circuit. Switches shall be complete with insulated base, and pressure or solderless lugs (suitable for use with 75 degrees C conductors). Handles shall be front or side operated. Switches shall be horsepower rated, capable of breaking stalled-rotor motor current at these ratings. Unless noted otherwise, outdoor locations shall have NEMA type 3R enclosures; indoor locations shall have NEMA 1 enclosures. Switches shall have provision for padlocking in the "off" position. 600 ampere or smaller switches shall be complete with rejection feature to ensure rejection of fuses other than Class R. Safety switches shall be Square D General Duty type for 208-240 volt non-fused switches and Heavy Duty type for 480 volt switches and 208-240 volt fused switches. Equal equipment as manufactured by GE, Siemens or Westinghouse will be acceptable.

B. Nonfused disconnect switches for single phase motors may be Hubbell #HBL1221I, 20A/1P horsepower rated (for 115V motors) or #HBL1222I, 20A/2P horsepower rated (for 208-240 motors) as required; in outdoor locations these switches shall be mounted in FS condulets with #DS 185 covers and gaskets.

2.7 FUSES

Provide one complete set of fuses, together with 33% spares, for each fuseholder. Fuses 600A and below shall be Buss Low-Peak, Littlefuse Little Peak, or Gould Shawmut Amptrap II, Type RK-1, current limiting and time delay, rejection type, unless noted otherwise. Fuses above 600A shall be Buss Low-Peak, Littlefuse KLP-C or Gould Shawmut Amptrap, UL listed Class L, current limiting and time delay, with 200,000 amp rms interrupting rating, silver plated contact surfaces. Where fuses are used with magnetic starters, fuses shall be reduced in ampere rating (from the sizes indicated) to the maximum rating allowed for each particular starter, as stated on starter nameplate.

2.8 AUTOMATIC LIGHTING SHUT-OFF DEVICES

A. Corner-mounted automatic lighting shut-off devices shall be Watt Stopper Series DT-200 or equal, (mounted on ceiling at wall) with selectable passive infrared detection technology and active ultrasonic detection technology, and selectable "initial" and "maintained" settings. Passive ultrasonic sensors that listen for audible sounds are not acceptable.

B. Ceiling mounted automatic lighting shut-off devices shall be Watt Stopper series DT-300 or equal, ceiling mounted, low-profile, with selectable passive infrared

detection technology and 360 degree active ultrasonic detection technology, and selectable “initial” and “maintained” settings. Passive ultrasonic sensors that listen for audible sounds are not acceptable.

C. Wall-mounted automatic lighting shutoff devices shall be Watt Stopper Series DW-100 or equal, with selectable passive infrared detection technology and active ultrasonic detection technology, and selectable “initial” and “maintained” settings. Passive ultrasonic sensors that listen for audible sounds are not acceptable.

D. Timer type wall mounted automatic lighting shut-off devices shall be Watt Stopper series TS or equal wall mounted, with digital countdown operation on LCD and with audible and blink shut off warning features.

E. Provide power supplies and relay packs as required for control of fixtures in room (except for fixtures indicated to be controlled by manual switches). [Separate relay packs shall be provided for normal and emergency circuits.] Provide wiring in raceway as required to interconnect automatic lighting shut-off device(s), power supplies, relay packs, and lighting fixtures.

F. Where automatic lighting shut-off devices control lighting fixtures, the automatic lighting shut-off system shall be compatible with the voltage of the lighting fixtures. Where automatic lighting shut-off devices control lighting contactors, the automatic lighting shut-off system shall utilize same control voltage as lighting contactor coil.

G. Where switches are indicated in areas controlled by automatic lighting shutoff devices, auto/off toggle switches shall be provided to interface with this system.

H. Automatic lighting shutoff devices shall have a programmable time delay before automatically turning off the lighting fixtures upon no sensing of occupants. This setting shall be a minimum of 30 minutes unless otherwise directed by the Owner.

I. Where an automatic lighting shut-off system is to control a fan, automatic lighting shut-off device (and associated power supplies/relay packs) shall be horsepower rated as required.

J. Automatic lighting shut-off devices with ultrasound detection technology shall be mounted no closer than 6'-0" from HVAC supply registers. Generally, automatic lighting shut-off devices shall not be mounted in areas with high volume of air flow.

K. Contractor shall furnish and install complete automatic lighting shut-off systems including wiring and raceways, and all other equipment, whether specifically indicated or not, to provide complete and operating systems. Submittal shall be provided to show locations of components, (recommended by the manufacturer of the particular system), wiring, and operation.

L. During submittal preparation, manufacturer should determine the appropriate

sensing technology for both 'initial occupancy' and 'maintain occupancy' for its location and application and make alterations as necessary. Care should be taken when selecting the sensing technology when detecting occupants in rooms which contain windows, partitions, aisles, etc. These settings shall be indicated in the submittal. A factory-trained technician shall make adjustments to the sensors on the jobsite for proper performance. In addition, a factory-trained technician shall visit the project 3 months after substantial completion to review operation of these devices, review operation with Owner, and make adjustments. He shall also do this at 6 months, 9 months, and 1 year after substantial completion.

2.9 WARNING SIGNS

A. Standard industry "DANGER HIGH VOLTAGE" warning signs shall be provided as required by the National Electric Code and as follows:

1. On each door of automatic transfer switches.
2. On each removable panel of transformers.
3. On other equipment (such as safety switches, etc.) containing energized components which are exposed when door is opened or access panel is removed.

B. A warning sign shall be provided on switchboards, panelboards, and motor control centers to warn of potential electric arc flash hazards.

C. A warning sign "AUTOMATIC STARTING ENGINE GENERATOR" shall be provided on each side of the engine generator housings.

D. A warning sign "WARNING -- PARTS OF THE CONTROL PANEL ARE NOT DE-ENERGIZED BY THIS SWITCH" shall be provided on or adjacent to each elevator disconnect switch.

E. A permanent sign (white phenolic to show black letters) shall be provided on panelboards and switchboards with stinger leg to indicate "Caution ____ phase has ____ volts to ground."

PART 3 - EXECUTION

3.1 METHODS OF WIRING

A. Systems shall be 4-wire, 3-phase, 120/208 volts, A.C. and 4-wire, 3-phase, 277/480 volts, A.C.

B. Provide power wiring as required whether indicated on drawings or not. Homerun raceways to panelboards shall be provided for wiring and shall be limited to the

following combinations (which shall also include equipment grounding conductor):

1. One 1-pole circuit (hot and neutral conductors).
2. Two 1-pole circuits (2 hot conductors and 2 neutral conductors), if derated per NEC table 310.15(B)(3)(a).
3. Three 1-pole circuits (3 hot conductors and 3 neutral conductors), if derated per NEC table 310.15(B)(3)(a).
4. One 2-pole circuit (2 hot conductors).
5. One 2-pole circuit (2 hot conductors and one neutral conductor).
6. One 3-pole circuit (3 hot conductors and one neutral conductor).

Where wiring sizes are not indicated on the drawings, the Contractor shall install #12 AWG or larger wiring as required for the ampacity of the particular equipment to be fed. These sizes shall be increased in size (to reduce voltage drop) for the following:

7. 120/208 wiring from panelboard to center of load with length (single conductor length) greater than 50'.
8. 277/480 wiring from panelboard to center of load with length (single conductor length) greater than 100'.

Additional increases in wire sizes shall be made as required to avoid excessive voltage drops. In particular, #8 conductors shall be used for 20A branch circuits with single conductor length (to center of load) greater than 100'.

C. Where a neutral conductor is required for a branch circuit, it shall be dedicated to that branch circuit and shall not be shared by other branch circuits.

D. Unless otherwise indicated on drawings or specified hereinafter, wiring installed outdoors (not underground or in fill beneath slab) shall be contained in rigid threaded heavy wall galvanized steel conduit (hot dipped, inside and out).

E. Unless otherwise indicated on drawings or specified hereinafter, [other] wiring shall be contained in electric metallic tubing.

F. Unless specifically indicated otherwise on the drawings, aluminum conduit may be used in lieu of steel conduit, provided same does not run underground or in concrete. Where aluminum conduit is used, fittings, outlet boxes, junction boxes, and accessories shall be aluminum.

G. All raceways shall be concealed unless otherwise indicated.

H. Branch circuit raceways feeding outlets in masonry walls shall be concealed in the masonry. Where outlet boxes are indicated in bare masonry walls, the box shall be mounted so that two edges of the box or plaster cover will fall in a mortar joint. Where switch boxes will not accommodate the number of conductors required and 4" square or larger boxes are installed, provide device covers 1" minimum in depth with straight rectangular openings for dry-wall type construction. Where grouting is required to fill up improperly cut openings in the masonry, the work will be rejected. The work of this section shall be coordinated with the masonry work to insure a neat and workmanlike job.

I. Solderless spring type connectors similar to Scotchlok connectors, Ideal colored Wingnuts, or Ideal Crimps with Wrapcaps shall be used for branch circuit wiring and fixture splice connections. Solderless connectors of the split-bolt type shall be used for splices on conductors #8 and larger.

J. Splices in low voltage wiring (50 volts and less) shall be made at terminal blocks furnished with the equipment. At junctions or where other splices are required, these splices shall be soldered or made with approved compression connectors.

K. Termination of branch circuit and feeder conductors shall be made using mechanical or compression lugs, unless noted otherwise. Where lugs are not furnished with equipment (including Owner-furnished equipment), Contractor shall provide lugs as required for a complete installation.

L. Termination of low voltage wiring (50 volts and less) and control/monitor/instrumentation wiring (120 volts and less) shall be made using compression type (ring or spade) terminals similar to T&B Sta-Kons.

M. Connections to generators, and motors (not equipped with a portable cord) shall be made with a short piece of steel flexible metal conduit between rigid conduit system and motor terminal box. Where the motor is located inside a vibrating housing, connection between housing and motor terminal box shall be made with a short piece of steel flexible metal conduit, and connection between rigid conduit system and housing shall be with a short piece of steel flexible metal conduit. Ground bond of separate copper conductor shall be made between motor frame and rigid conduit system. In outdoor locations and other locations subject to moisture or water leakage (including fire pumps), liquid-tight flexible metal conduit shall be used. Wiring within these flexible metal conduits shall be stranded. "Short piece of flexible metal conduit" is defined as the shortest piece that will provide proper vibration isolation.

N. Taps in feed-thru panelboards and/or wireways and junction boxes shall be made with clear-taps, or OZ gutter taps, complete with bakelite covers.

O. Recessed LED troffers shall be wired with #12 AWG type RHH, THHN, or XHHW conductors in 4 to 6 feet of ½" flexible metal conduit from a box at least 1 foot from the fixture. Recessed downlights (incandescent, compact fluorescent, LED, and H.I.D.) shall be wired with conductors as heretofore specified in 4 to 6 feet of flexible metal conduit from a box at least 1 foot from the fixture, unless the fixture is of the pre-wired type with an

integral outlet box approved for the number and type of branch circuit conductors indicated and/or specified. Not more than two individual fixtures shall be connected to any of these outlet boxes. This box shall be located above the ceiling and shall be accessible from attic, by removing acoustical tile in accessible ceiling or by removing fixture in a non-accessible ceiling. Installing blank covers on ceilings to provide access to such boxes will not be acceptable.

P. Typewritten directory of circuits shall be provided for each panelboard to include spares and spaces. The room numbers and items served shall be indicated for each circuit. (Circuit numbers indicated on the drawings are shown for the purpose of clarifying the grouping of outlets. The actual number assigned to the circuits in the panelboard shall suit the bussing and branch circuiting to panelboard.)

Q. Branch circuit wiring through lighting fixtures shall be in accordance with Articles 410.11, 410.31, 410.32, and 410.33 of the National Electrical Code; however, conductor types shall be as specified hereinbefore.

R. Unless a larger size is indicated or required by code or manufacturer, raceways shall be sized in accordance with Table 1 for the number and conductor size (AWG and MCM) shown or specified. Where combination of secondary (0-600 volt) conductor sizes are indicated, the raceway shall be sized in accordance with Table 2 based on the insulated conductor areas of Table 3, for the project conductor sizes (AWG and MCM) indicated even though the actual diameters and areas of the conductors to be installed may differ from those in Table 3.

Table 1

Maximum Number of Conductors in Trade Sizes of Conduit or Tubing													
	Conduit Trade Size (Inches)												
	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Conductor Size AWG, MCM													
14	3	6	10	18	25	41	58	90	121	155			
12	3	5	9	15	21	35	50	77	103	132			
10	2	4	7	13	18	29	41	64	86	110	138		
8	1	2	4	7	9	16	22	35	47	60	75	94	137
6	1	1	2	5	6	11	15	24	32	41	51	64	93
4	1	1	1	3	5	8	12	18	24	31	39	50	72
3	1	1	1	3	4	7	10	16	22	28	35	44	63
2		1	1	3	4	6	9	14	19	24	31	38	56
1		1	1	1	3	5	7	11	14	18	23	29	42
0		1	1	1	2	4	6	9	12	16	20	25	37
00			1	1	1	3	5	8	11	14	18	22	32
000			1	1	1	3	4	7	9	12	15	19	28
0000			1	1	1	2	4	6	8	10	13	16	24
250				1	1	1	3	5	6	8	11	13	19
300				1	1	1	3	4	5	7	9	11	17
350				1	1	1	2	4	5	6	8	10	15
400				1	1	1	1	3	4	6	7	9	14
500				1	1	1	1	3	4	5	6	8	11
600					1	1	1	2	3	4	5	6	9
700					1	1	1	1	3	3	4	6	8
750						1	1	1	3	3	4	5	8

Table 2

Dimensions and Percent Area of Conduit and of Tubing										
Trade Size	Internal Diameter Inches	Total 100%	Area – Square Inches							
			Not Lead Covered			Lead Covered				
			2 Cond. 31%	Over 2 Cond. 40%	1 Cond. 53%	1 Cond. 55%	2 Cond. 30%	3 Cond. 40%	4 Cond. 38%	Over 4 Cond. 35%
1/2	.622	.30	.09	.12	.16	.17	.09	.12	.11	.11
3/4	.824	.53	.16	.21	.28	.29	.16	.21	.20	.19
1	1.049	.86	.27	.34	.46	.47	.26	.34	.33	.30
1 1/4	1.380	1.50	.47	.60	.80	.83	.45	.60	.57	.53
1 1/2	1.610	2.04	.63	.82	1.08	1.12	.61	.82	.78	.71
2	2.067	3.36	1.04	1.34	1.78	1.85	1.01	1.34	1.28	1.18
2 1/2	2.469	4.79	1.48	1.92	2.54	2.63	1.44	1.92	1.82	1.68
3	3.068	7.38	2.29	2.95	3.91	4.06	2.21	2.95	2.80	2.58
3 1/2	3.548	9.90	3.07	3.96	5.25	5.44	2.97	3.96	3.76	3.47
4	4.026	12.72	3.94	5.09	6.74	7.00	3.82	5.09	4.83	4.45
4 1/2	4.506	15.94	4.94	6.38	8.45	8.77	4.78	6.38	6.06	5.56
5	5.047	20.00	6.20	8.00	10.60	11.00	6.00	8.00	7.60	7.00
6	6.065	28.89	8.96	11.56	15.31	15.89	8.67	11.56	10.98	10.11

Table 3

Dimensions to be Used for Insulated Conductors		
Size AWG MCM	Approx. Diam. Inches	Approx. Area Sq. In.
Col. 1	Col. 2	Col. 3
18	.146	.0167
16	.158	.0196
14	.204	.0327
12	.221	.0384
10	.242	.0460
8	.328	.0854
6	.397	.1238
4	.452	.1605
3	.481	.1817
2	.513	.2067
1	.588	.2715
0	.629	.3107
00	.675	.3578
000	.727	.4151
0000	.785	.4840
250	.868	.5917
300	.933	.6837
350	.985	.7620
400	1.032	.8365
500	1.119	.9834
600	1.233	1.1940
700	1.304	1.3355
750	1.339	1.4082
800	1.372	1.4784
900	1.435	1.6173
1000	1.494	1.7531
1250	1.676	2.2064
1500	1.801	2.5475
1750	1.916	2.8895
2000	2.021	3.2079

S. However, unless a larger size is indicated or required by code or manufacturer, raceway for communication wiring (defined by NEC Chapter 8) shall be sized as a minimum per Table 1 in NEC Chapter 9.

T. In 277/480 volt systems, wall switches grouped or ganged in an outlet box shall be so arranged that voltage between adjacent switches does not exceed 300 volts, or the box shall be equipped with permanently installed barriers between adjacent switches. Where wall switches for normal system and emergency system are grouped or ganged in an outlet box, permanently installed barriers shall be provided in the outlet box to separate the normal and emergency systems.

U. Approved thread lubricant containing powdered zinc or lubricating graphite shall be applied to the male threads only of aluminum conduit to prevent joint seizure.

V. Other routings than those indicated may not be used without the approval of the Architect, but the Contractor shall make allowance for possible obstruction to routes indicated.

W. Certain areas and hollow spaces between suspended ceilings and slabs above are being used for environmental air and electrical work therein shall be in accordance with Article 300.22 of the National Electrical Code and the Jefferson Parish building code.

X. Raceways shall be supported in accordance with the National Electrical Code for the particular type of raceway; however, for rigid metal conduit and electrical metallic tubing, the maximum spacing between supports shall not exceed ten feet.

Y. Wall switches indicated by doors shall be located on the strike side (lock side), 6" maximum from door frame to the side of the outlet box; however, for double doors switches shall be located where shown, usually clear of the door in the full open position.

Z. The Contractor shall install additional boxes or fittings in raceways as required to properly install conductors. The locations of these boxes or fittings shall be subject to the Architect's approval.

AA. Where a maximum fuse (or circuit breaker) rating is indicated on the nameplates of the magnetic starters, control panels, contactors, etc. (or equipment containing these components) for the specific mechanical equipment, the Contractor shall reduce ampere rating of fuses (or circuit breaker) to be installed (from the sizes indicated). These ratings shall also be increased as necessary to comply with NEC Paragraph 430.52 (C)(1), Exception 2.

BB. Suitable waterproof cable identification tags shall be installed on each power feeder in each pull (junction) box.

CC. Where conductors without raceway penetrate smoke partitions and/or fire rated partitions and floors, a conduit sleeve shall be installed rigidly in the penetration so

that the conductors can pass through it. A UL listed fire-stop putty such as Nelson Flameseal shall be installed around the sleeve and inside the sleeve after the conductors are installed.

DD. Where roof penetrations are required for conduits supplying roof-mounted HVAC equipment, these penetrations shall be of the piping roof curb type per National Roofing Association standards.

EE. Where variable speed drives are used, the disconnect switch at the motor shall have an auxiliary contact wired to the variable speed drive to turn off the drive when the disconnect is opened.

FF. Where electrical work penetrates or is installed in fire and/or smoke partitions, this work shall be installed per UL standards. A U.L. listed fire-stop putty such as Nelson Flameseal shall be installed around raceway penetrations.

GG. A branch circuit neutral conductor shall be installed to each lighting switch outlet box, and if not connected, it shall be terminated with a wire nut. This requirement also applies to wall-mounted occupancy sensors. This conductor is not shown on drawings.

3.2 WIRING IN CONDUIT (APPLIES ALSO TO E.M.T.)

A. Where several conduits (concealed and/or exposed) are run parallel to each other, they shall be grouped together on galvanized P-1 000 Unistrut, with suitable clamps, which shall be attached to the wall or hung from the roof or structural ceiling. Where exposed conduit is indicated, the conduit shall be installed parallel with or at right angles to the building walls and/or ceiling (roof) and shall be supported adequately by pipe straps or other approved devices. Where a single conduit is run exposed in a damp and/or wet location, standoff straps of the type which permit a 1/4" air space between the conduit and the wall should be used. Fastening of conduit shall be as follows: to wood by means of screws; to masonry by means of threaded metal inserts, metal expansion screws, or toggle bolts; and to steel by means of machine straps, bolts, or power actuated fasteners. Raceway fasteners shall be approved for the purpose (tie wire shall not be used).

B. Conduit in concrete slabs shall be located so as not to affect the structural strength of the slabs. Conduit in general shall be located in the center 1/3 thickness of concrete slabs and when installed in slabs poured on grade or fill shall have at least one inch of concrete between conduit and plastic or other waterproof membrane; conduit shall not be installed under the plastic or other waterproof membrane unless it is to be installed "In fill beneath slab" in which case the installation shall meet the requirements indicated heretofore. The maximum size of conduit that may be run in a slab shall be as directed by the Architect. Conduit larger than 3/4", if permitted in reinforced concrete slabs, shall be parallel with or at right angles to the main reinforcement; when at right angles to the reinforcement, the conduit shall be close to one of the supports of the slab.

C. Conduits which must cross building expansion joints shall, where practicable,

cross same in furred ceilings areas rather than in slabs or walls, arranged with sufficient flexibility to accommodate the building expansion. However, where such routing is not possible, galvanized expansion fittings shall be provided in each raceway attached to the structure whenever the raceway crosses an expansion joint. Expansion fitting shall be installed on one side of the joint with its sliding sleeve end flush with the joint and with a length of bonding jumper in the expansion joint equal to at least three times the normal width of the joint. Each expansion fitting shall be zinc-coated steel and contain heavy factory installed packing and internal copper braid packing and shall be complete with UL approved bonding jumper.

D. Unless noted otherwise on drawings, underground runs of conduits shall be installed so that the top of the concrete envelope shall not be less than 42" below grade for conductors operated over 600V and not less than 24" below grade for 600V or less except that under roads and pavements the minimum for 600V or less shall be 30" below grade. In non-concreted areas, encasement around conduit stub-ups shall extend to a location just above grade, and top shall be sloped to drain.

E. Concrete and reinforcing shall conform to DIVISION 3, CONCRETE. Concrete strength shall be 3000 psi unless noted otherwise on drawings. Concrete shall be colored red for underground conduit applications with an approved admixture.

F. Conduits shall be kept at least 6" from runs of hot water piping, flues, or other hot object.

G. Where conduits rise through a concrete floor, the curved portion shall not be visible above the finished floor. Approved waterproof compound or conduit sealing bushing shall be used where underground conduits enter building. Where these conduits penetrate areas below grade, conduit-sealing bushings that resist water head-pressure shall be used.

H. Where conduit fittings are installed, these shall be Crouse-Hinds or Appleton cast type.

I. Connectors and couplings for electric metallic tubing shall be of the steel compression type. Couplings for rigid heavy wall conduit shall be of the threaded type; two locknuts and one bushing shall be provided where heavy wall conduits enter boxes or equipment. Flexible metal conduit connectors shall be of the squeeze type with screw and locknut. Liquid-tight connectors shall be steel compression type.

J. Insulated bushings shall be provided for conductors #4 and larger.

K. No wires shall be pulled in until the conduit system is complete. Only approved type pulling lubricant shall be used.

L. During construction, outlet boxes and conduit stub-ups shall be suitably protected against the entrance of foreign materials.

M. Conduit in suspended ceilings shall be located, where practicable, in the

space between the ceiling and the concrete slab above. Raceways shall not be installed immediately above accessible acoustical ceiling (restricting tile removal) without written approval of Architect for the specific location. Raceways shall also not be installed in such a manner to restrict or block access to plenums, equipment, etc.

N. Tie wires shall not be used for support of raceways. Raceways shall be supported by threaded rods, strut, building structure, etc. that secure the raceways (to prevent both vertical and horizontal movement) in addition to supporting them.

O. Where concrete joist construction is employed, arrange with those responsible for DIVISION 3 - CONCRETE to provide in contact ceilings and in unfinished ceilings such headers as may be required to receive boxes for fixtures.

P. Threaded heavy-wall galvanized conduit with vapor-proof fittings shall be used in cold storage rooms, and drain and sealing fittings (and expansion fittings, where necessary to compensate for thermal expansion) shall be provided where conduits enter room. Type MI cable may be used in lieu of threaded conduit for this wiring, in which case drain and sealing fittings will not be required.

Q. Where raceways pierce walls of HVAC housings, these penetrations shall be made per requirements of the HVAC housing manufacturer.

R. Raceways shall not be installed within 24" of VAV units, fan-powered boxes, and other mechanical equipment located above ceilings, except for those raceways that serve these units. Raceways shall be located to allow maintenance personnel to remove ceiling tiles below these spaces to service this equipment.

S. Where flexible metal conduit or liquid-tight flexible metal conduit is installed, it shall be securely fastened within 12" of connection point, and additional supports shall be provided per NEC 348 & 350.

3.3 GROUNDING

A. The metallic raceway system and the neutral conductor of the wiring system shall be grounded at the service equipment [(including emergency service equipment)]. The insulated copper service grounding electrode conductor shall be extended with no splices in raceway from the service to within 5 feet of the point of entrance of the metal underground water service pipe that is electrically continuous and is in direct contact with the earth for at least 10 feet per NEC 250.68(C). Where the raceway routing is via finished areas, it shall be run concealed. Ground connection shall be visible, and connection of raceway and conductor to the water pipe shall be made with an approved ground connector similar to T & B conduit hub and water pipe clamp. Also, see Article 250.50, Grounding Electrode System and Grounding Electrode Conductor of the National Electrical Code for bonding requirements to other items to form the grounding electrode system (this includes bonding to metal frame of building and to concrete-encased electrode to be located near the service equipment).

B. The above requirements shall be supplemented by grounding to $\frac{3}{4}$ " diameter by 10' long copper clad ground rods, and to an encased electrode (consisting of a 20' minimum length of 4/0 B.C. cast in a grade beam or similar concrete-encased foundation member below the vapor barrier).

C. At each point of voltage transformation (including but not limited to transformers and inverters), the secondary neutral conductor and the secondary raceway system shall be grounded with a common insulated ground conductor as described in Article 250.30 of NFPA 70, National Electrical Code. The grounding electrode conductor described therein shall be continuous (no splices) and shall be in a raceway. Where the raceway routing is via finished areas, it shall be run concealed. Ground connection shall be visible. Where water pipe connection is used, connection of raceway and conductor to a water pipe shall be made with an approved ground connector similar to T & B conduit hub and water pipe clamp and the connection shall be within 5 feet of the point of entrance of the metal underground water service pipe that is electrically continuous and is in direct contact with the earth for at least 10 feet per NEC 250.68(C).

D. Grounding bushings with bonding jumpers shall be used around concentric or eccentric knockouts on equipment and on raceways stubbed up below open-bottom equipment such as pad-mounted transformers, switchgear, substations, and switchboards.

E. Grounding pole of each polarized receptacle (non-isolated ground type) shall be bonded to its outlet box with conductor sized in accordance with Table 250.122 of the National Electrical Code and a machine or self-tapping screw, unless the receptacle is of the approved self-grounding type.

F. Grounding conductors used to bond across flexible metal conduits containing transformer secondary conductors shall be sized per NEC Table 250.66 based on size of the secondary conductors.

G. Each branch circuit and feeder shall be provided with a ground conductor installed with the circuit conductors. Each ground conductor shall be a green insulated copper conductor, sized in accordance with Table 250.122 of the National Electrical Code NFPA-70. These grounding conductors are not shown on the drawings.

H. All receptacles (and their outlet boxes) and non-current carrying conductive surfaces of fixed electrical equipment likely to become energized that are subject to personal contact in patient care areas, operating at over 100 volts, shall be grounded (directly connected) by green insulated copper conductor, sized in accordance with Table 250.122 of the National Electrical Code, NFPA 70, and installed with the branch circuit conductors to meet NEC 517.13(B).

I. Where water pipe grounding connection is made underground, a suitable plastic pipe sleeve and flush metal cover shall be installed to provide access to the connection.

J. Where ground connections are made in walls or inaccessible ceilings, access

panels shall be installed. Access panels in walls shall be stainless steel.

K. See drawings for additional grounding requirements.

3.4 MOUNTING HEIGHTS

A. If not otherwise indicated, mounting heights to centerline of outlets shall be as follows:

1. Receptacles -- 18" above floor.
2. Switches -- 48" above floor.
3. Bracket fixtures -- 7'0" above floor or, where mounted above exterior door, mirror or medicine cabinet, at a height just sufficient to clear the swing of the door or medicine cabinet.
4. Exit lights -- at a height just sufficient to clear the swing of the door, unless noted otherwise.
5. Voice/data outlets -- 18" above floor.

B. The above mounting heights may be adjusted as required to permit bottom or top of plate to align with mortar joints in unfinished masonry walls, provided joints are not raked. Where joints are raked, adjust height as required to insure that center of outlet box will be in the center of masonry unit. Where outlets at different levels are shown adjacent, they shall, where possible, be installed on a common vertical centerline. Where these adjustments are made, 18" shall be the minimum mounting height for receptacles, telephone outlets, and computer outlets, and 48" shall be the maximum mounting height for switches.

3.5 MARKING OF STARTERS, SAFETY SWITCHES, AND PANELBOARDS

A. Each surface manual starting switch out of sight of the motor which it controls, and each panelboard, switchboard, transformer, enclosed circuit breaker, automatic transfer switch, contactor, magnetic starter, safety switch, and toggle switch used as an in-sight disconnect for any equipment regardless of location, shall be suitably identified by means of 1/4" high letters cut in white laminated phenolic strips to show black letters. Strips shall be attached to cover by means of two screws. Device plate for each flush manual starting switch and wall switch used as starting switch or safety switch shall be suitably engraved to identify the equipment controlled.

B. A phenolic nameplate shall be provided on transformers, panelboards, and switchboards to indicate the upstream device (panelboard, switchboard, etc.) where the power originates to read "Panel ____ (fed from Panel ____)", or "Transformer is fed from ____".

- END OF SECTION -

SECTION 262000 - ELECTRICAL SERVICE AND DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes providing labor, materials, and equipment indicated, specified, and necessary for a complete and operating distribution system and related systems, in accordance with SECTION 260000 - ELECTRICAL GENERAL PROVISIONS.

1.2 APPLICABLE PARAGRAPHS

Applicable paragraphs of SECTION 260500, ELECTRICAL BASIC MATERIALS AND METHODS, shall apply to this Section as though repeated herein.

1.3 EQUIPMENT LOCKS

Panelboards, cabinets, and other electrical equipment having doors with locks, shall be keyed alike.

1.4 SERVICE EQUIPMENT

Safety switches, panelboards, and switchboards used as service equipment shall be Underwriters Laboratories listed and labeled for the application. A phenolic nameplate (white with black-cut letters) shall be provided on service equipment to indicate "maximum available fault current is ____KA" and date that "calculation was made on ____".

1.5 CIRCUIT BREAKER ARRANGEMENT

In multi-section panelboards, circuit breakers, fusible switches, and spaces shall be divided equally between sections (unless indicated otherwise). In general, each section of multi-section panelboards shall have the same quantity of pole capacity (i.e. two sections with 36 poles in each rather than one section with 42 poles and one section with 30 poles). The circuit arrangement on panelboard schedules is used only to convey circuit assignment, not locations of circuit breakers in panelboard.

1.6 CIRCUIT DIRECTORIES FOR PANELBOARDS/SWITCHBOARDS

Type-written circuit directories shall clearly indicate the associated room as well as the load and location of the load (e.g., Classroom 101 - Lighting Fixtures, Storage 102 - Receptacle on Northwest Wall, Mechanical 103 - Heat Trace on South Wall, etc.).

PART 2 - PRODUCTS

2.1 CIRCUIT BREAKERS

A. Each circuit breaker shall have continuous current rating visible without removing an enclosure cover, and the rating shall be engraved. This may be accomplished by installation of a phenolic label (white with black cut letters) adjacent to the circuit breaker. Circuit breakers shall be suitable for use with 75 degree C conductors. Where circuit breakers are used to supply HVAC equipment having motor group combinations, type HACR circuit breakers shall be used. Circuit breakers installed in existing panelboards or switchboards shall be of the proper type to be installed therein, shall include bussing kits/alterations as required, and shall have an interrupting capacity of not less than that of the existing circuit breakers. Where circuit breakers are not available to fit existing panelboard, panelboard shall be removed and replaced with new. Circuit breakers used for vending machines, hard-wired electric water coolers, and dwelling unit dishwashers shall be GFI type.

B. Unless indicated otherwise, circuit breaker spaces and spare circuit breakers shall be divided equally between sections of multi-section panelboards.

C. Where ground-fault protection is provided for 3-pole circuit breakers (or fusible switches), performance testing of the ground fault protection system shall be provided after installation. Written documentation for this test shall be provided to the Engineer.

D. Where a circuit breaker with adjustable long time trip (where cover over adjustment is not lockable per NEC 240.6 (C)) is used, conductor size for the protected feeder shall be increased by the Contractor to match maximum long time setting of the circuit breaker.

E. Circuit breakers in panelboards shall be fully rated for AIC; that is, series ratings are not acceptable.

F. Circuit breakers used to supply power to transformers shall have pad-lock "off" feature, unless the circuit breaker is within sight of the transformer.

G. Circuit breakers for circuits feeding appliances that are hard-wire connected and do not have integral disconnects or sight disconnects shall be provided with permanently-attached handle padlockable lock-off to meet the requirements of NEC 422.31(B) & (C). An example of this is hand dryers.

2.2 FAULT CURRENT AND PROTECTIVE DEVICE COORDINATION STUDY

A. A fault current and protective device coordination study shall be prepared by the Contractor within 30 calendar days following final review of circuit protective devices, including circuit breakers, fuses, overloads, and protective relays. The study shall include calculations and composite time-current characteristic coordination curves to demonstrate proper coordination of protective devices to be installed and to protect equipment and

conductors against fault currents and sustained overload conditions for conductors and equipment to be installed. The study shall further indicate proper coordination with existing protective devices. The study shall include the proper ratings of fuses and proper settings of adjustable circuit breakers associated with the protection of equipment and conductors and optimum selective coordination. If necessary, the study shall also make recommendations for changes to new protective devices, and these changes shall be made by the Contractor at no additional cost to the Owner; for this reason, the study shall be finalized prior to Contractor releasing equipment for production. Also for this reason, the Contractor should consider using the panelboard manufacturer to make this study. Contractor shall test and calibrate protective devices in accordance with the manufacturers' specification after making the proper device settings and before the initial energization of the conductors and equipment. Contractor shall obtain required data from the utility company [for coordination with the utility company's facilities.] [This study shall also consider the various scenarios associate with engine generator(s) as the power source.].

B. An ARC flash hazard study in accordance with NFPA 70E guidelines shall be prepared by the Contractor, along with the study indicated above, to provide a summary table to include energy levels/faults, equipment characteristics, working boundaries, and hazard/risk categories for existing and new equipment including panelboards, transformers, circuit breakers, safety switches, motor starters, etc. The study shall include complete descriptive narratives of methods used and effect of the results. The Contractor shall also install the specific NFPA 70E arc flash labels on the exterior surfaces of each equipment item.

PART 3 - EXECUTION

3.1 EMERGENCY LIGHTING SYSTEM

A. Emergency fixtures including internally illuminated exit signs shall be permanently fixed in place and connected to building branch circuits. Fixtures shall contain a rechargeable battery, battery charging means, one or more lamps and other components to be UL approved and meet NEC Article 700.12(F).

B. Where battery fixtures are used with switched branch circuits, the sensor circuit of each fixture shall be connected ahead of any local switching. This will permit "switching-off" fixture without signaling to sensor circuit that a power failure has occurred and "turning-on" of lamps on battery circuit. A failure of the branch circuit shall cause the lamps to turn on whether the switch is in the on or off position.

C. Exit fixtures shall not be switched.

3.2 ELECTRICAL ROOMS

A. Contractor shall review the physical sizes of the substations, panelboards, transformers, etc. (based on shop drawings) and assure that they will fit in the electrical

rooms with proper code clearances. The locations may require adjustment. Contractor shall provide a 1/4" scale drawing of the electrical rooms containing this equipment to demonstrate that it fits properly.

- END OF SECTION -

SECTION 265000 - ELECTRICAL LIGHTING

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes labor, materials, and equipment indicated, specified, and necessary for a complete and operating lighting system and related systems in accordance with SECTION 260000 - ELECTRICAL GENERAL PROVISIONS.

1.2 APPLICABLE PARAGRAPHS

Applicable paragraphs of SECTION 260500 - ELECTRICAL BASIC MATERIALS AND METHODS, shall apply to this Section as though repeated herein.

PART 2 - PRODUCTS

2.1 EXIT LIGHTS

A. Exit lights shall be Lithonia LES series with red letters on a metal stencil, 2 circuits. Stencil and exposed metal parts shall be cast aluminum. Housing shall have black finish and stencil shall have brushed aluminum finish. Each fixture shall have concealed LED's. Units shall be rated for dual voltage 120/277V. Housing thickness shall be maximum 1⁷/₈". See symbol schedule on drawings for mounting details. Fixtures shall meet NFPA 101, with chevron style arrows.

2.2 OTHER FIXTURES

- A. Other fixtures shall be as specified in schedule on drawings.
- B. Fixtures to be installed in damp or wet locations shall be labeled by Underwriters' Laboratory for that purpose.
- C. Fixtures shall be finished (painted or other finish as specified) after fabrication.
- D. Trims for recessed fixtures shall be of the type necessary for compatibility with each ceiling type (such as concealed T, wide T, slot grid, flange trim, etc.). Coordinate with architectural drawings and specifications.
- E. Where ceiling tiles are thicker than standard ceiling tiles, fixture throat/trim ring assemblies shall be custom-made to accommodate the ceiling system.

F. Fixture/pole/concrete foundation assemblies shall be provided to meet the local building code for wind loading with minimum requirement of 100 miles per hour at 30 feet above grade. Submittal shall clearly indicate that this requirement will be met.

PART 3 - EXECUTION

3.1 SUPPORTS

A. For any type ceiling which itself does not provide sufficient support for fixtures, either arrange with other subcontractors to strengthen ceiling or support fixtures from structure above independently of ceiling.

B. Suspended fixtures in continuous rows shall have one stem at the beginning of the row, one stem at each channel joint, and one stem at the end of the row.

C. Fixtures mounted individually on stems shall each have two single stem hangers. Fixtures individually surface mounted shall be supported at both ends.

D. Fixtures surface mounted in continuous rows shall have one support at the beginning of the row, one support at each channel joint, and one support at the end of the row.

E. Recessed fixtures installed in plaster ceilings and gypsum board ceilings (including ceilings with glue-on acoustical tiles) shall be furnished with metal plaster frames or other suitable mounting frames.

F. Recessed fixtures shall be so adjusted to their supports that their trim flanges fit tightly and evenly against the surface of the ceiling.

G. In acoustical tile ceilings with concealed mechanical suspension systems, recessed fixtures (troffers) shall be hung from suitable supporting channels. The placing of the supporting channels by other subcontractors must be coordinated so that they run in the same direction as the lamps and so that one channel will be where a troffer is to be installed and, then, in order to support the troffer, an additional channel must be installed by these other subcontractors, spaced the proper distance from the first mentioned channel. This Contractor shall cooperate with and advise these other subcontractors as to the exact location of channels desired. After the required channels are in place, troffers shall be supported from the channels by means of the adjustable suspension brackets which shall be used.

H. In acoustical tile ceilings with exposed mechanical suspension systems, recessed fixtures shall be lay-in type. Fixtures so supported shall be securely fastened to the ceiling's framing members by approved fixture support clips (4 required per fixture). Metal fixture appendages that simply fold down over the ceiling's framing members are not

acceptable. Arrange with other subcontractors to support ceilings at each corner of each of these fixtures (not more than 6 inches from each corner).

3.2 LOCATION OF FIXTURES

A. Work of this Section includes advising other trades of exact location of recessed fixtures so that ceiling construction and/or spacing may be coordinated as necessary to permit symmetrical positioning of fixtures in room.

B. Locations for lighting fixtures shall be per Architectural reflected ceiling plans.

C. For acoustical tile ceilings, surface and/or suspended fixtures shall be centered on a tile or a tile joint, unless indicated otherwise.

D. The locations of fixtures in Mechanical Equipment Rooms and Boiler Rooms are approximate. The Contractor shall determine exact locations based on exact locations of mechanical equipment.

E. 2'x2' fixtures shall be oriented so that all lamps are oriented in the same direction as other 2'x2' fixtures and 2'x4' fixtures in the area.

3.3 INSTALLATION AFTER PAINTING

Fixtures to be installed in or on painted ceilings and/or walls shall not be installed until painting is completed. Fixtures installed with paint applied over factory finishes will be rejected.

3.4 PROCEDURE

The Contractor shall demonstrate to the Owner at his convenience the proper procedure for relamping each type of fixture.

3.5 FIXTURE COORDINATION

Lighting fixture submittal shall include data on each type of ceiling suspension system and associated acoustical tile. Information on the ceiling suspension systems shall include types of recessed fluorescent fixture suitable for use with each type as well as recommended installation details.

3.6 FIXTURE ADJUSTMENT

Aim adjustable fixtures at night as directed by Architect or his designated representative. Furnish any equipment necessary for aiming fixtures. Equipment shall include but not be limited to bucket trucks, aerial booms, ladders, tools, meters and personnel. Use a factory prepared aiming diagram.

3.7 TAMPERPROOF TOOLS

Provide to the Owner two tools for each type of tamperproof hardware.

- END OF SECTION -

SECTION 270500 - COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes providing all labor, materials, and equipment indicated, specified, and necessary for complete and operating systems in accordance with SECTION 260000 - ELECTRICAL GENERAL PROVISIONS.

1.2 APPLICABLE PARAGRAPHS

Applicable paragraphs of SECTION 260500 - ELECTRICAL BASIC MATERIALS AND METHODS, shall apply to this Section as though repeated herein.

1.3 SYSTEMS INVOLVED

A. Systems involved include the following:

1. Raceways and Wiring for Voice/Data Outlets and Telephone Outlets [Infrastructure for Voice/Data System]

PART 2 - PRODUCTS

2.1 RACEWAYS AND WIRING FOR VOICE/DATA OUTLETS AND TELEPHONE OUTLETS

A. Contractor shall furnish and install backboards, terminal blocks, patch panels, outlets, Cat 6 wiring, cables and raceways, and all other equipment, whether specifically indicated or not, for a complete and properly operating system [expansion].

B. Data wall outlets shall consist of outlet box (4" square x 1½" deep, or larger), 1 gang raised device cover, and [6-module] plate with [two] data jacks (blue color, 8-position, category 6[a] module) and module blank covers. Finish and type of plate shall match that specified for wiring devices plates. Plate shall contain ID windows at top and bottom with appropriate label designations (type written).

C. Voice/data wall outlets shall be same as data wall outlets except each shall have [one] voice jack (white color, 8-position, category 6 module), two data jacks (blue color, 8-position, category 6 module), module blank covers and labeling (type written).

D. Provide a cable for each jack which shall be UL listed, 4-pair, 24 AWG, UTP (unshielded twisted pair) jacketed, plenum type, category 6. The voice cables and telephone cables shall have white-colored jacket and shall route up the raceway stub-up and then above the ceiling (attached with J-hooks) to terminate on patch panels on nearest

special systems backboard. The data cables shall have blue-colored jacket and shall route up the raceway stub-up and then above the ceiling (attached with J-hooks) to terminate on patch panels on nearest special systems backboard.

E. Backboards shall be 8' high by width as indicated by $\frac{3}{4}$ " thick plywood. Bottom of backboards shall be 6" above floor unless noted otherwise. Provide raceways from each backboard to space above accessible ceiling for routing cables to backboards. Raceways shall be terminated with bushings even with top and/or bottom of backboards. Backboards shall be painted with two coats of fire retardant paint prior to cable installation.

F. Provide the appropriate quantity of type 110 punch-down terminal blocks on [existing] backboards for termination of each conductor in each cable from analog telephone (voice) jacks and for termination of each conductor in each multi-conductor analog cable connecting the various backboards; these shall be punched down. Properly label (with permanent labeling means) each cable with room number and/or designation of jack connected thereto. Provide labels on each terminal block at backboards corresponding to room number and/or designation of jack connected thereto. Provide cross-connects for all conductors.

G. Provide the appropriate quantity of patch panels at existing backboards for termination of all cables and terminate each conductor in each cable from data jacks, and terminate each. Each patch panel shall be Category 6, with 48 ports, rack mounted. Wall mounted racks and/or floor-mounted racks shall be provided to accommodate patch panels, data switches, UPS's, etc. and other equipment including Owner-furnished equipment. Wire management accessories shall be provided for proper, neat installation. Properly label (with permanent labeling means) each cable with room number of jack connected thereto. Also label patch panels with room numbers. Provide patch cords as directed by Owner.

H. Where patch panels are used for other POE equipment such as wireless access points, IP-based cameras, etc. they shall be in addition to and separate from patch panels for voice/data.

I. Provide a #6 minimum insulated ground conductor to link backboards. Provide ground bus at each backboard and terminate ground thereto. Provide a #6 insulated ground conductor from building service ground to the nearest backboard.

PART 3 - EXECUTION

3.1 RACEWAY AND WIRING INSTALLATION FOR VOICE/DATA OUTLETS AND TELEPHONE OUTLETS

A. Raceways shall contain not more than two 90 degree bends.

B. Where wiring is installed above ceilings from stub-ups to backboards (without raceways and not in cable trays), they shall be properly supported from structure per National Electrical Code. Where ceilings are accessible, Contractor shall use J-hooks and/or cable trays. Where ceilings are inaccessible, Contractor shall provide raceways that span these areas.

C. Installers shall be certified.

D. All wiring and connections shall be tested per ANSI/TIA/EIA standards. Test reports shall be provided.

E. Provide a copper Telecommunications Grounding Busbar (TGB) to satisfy TIA/EIA and BICSI requirements at each backboard. TGB shall be 1/4" x 2" x 12" in size and contain pre-drilled to suit the User's requirements. TGB shall standoff from the backboard by 2' using insulator. Provide a #6 THHN ground conductor from the TGB (at backboard used for voice/data service) to the grounding electrode used for electric service.

-END OF SECTION -

SECTION 283100 - FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes providing all labor, materials, and equipment indicated, specified, and necessary for complete and operating systems in accordance with SECTION 260000 - ELECTRICAL GENERAL PROVISIONS.

1.2 APPLICABLE PARAGRAPHS

Applicable paragraphs of SECTION 260500 - ELECTRICAL BASIC MATERIALS AND METHODS, shall apply to this Section as though repeated herein.

1.3 SYSTEMS INVOLVED

A. Systems involved include the following:

1. Fire Alarm System

1.4 FIRE ALARM SYSTEM SUBMITTALS

A. Contractor shall have a certified fire alarm installer prepare equipment brochures, plan view and one line schematic shop drawings for the work of this contract.

B. Equipment brochures shall consist of items specified hereinafter and items that are pertinent to the work. The brochures shall include a sequence of operation, battery calculations, and statement identifying "type of system". These brochures shall be submitted for review per Paragraph 16010.2.3. Where remote station monitoring is required, brochures shall provide the name of the monitoring company (which must be Fire Marshal approved).

C. Shop drawings shall indicate sizes, quantities, and types of conductors, cables and raceways and details necessary to install the work, to include strobe candela ratings.

D. Contractor shall submit the following to the Architect for Fire Marshal review:

1. Six sets of the reviewed equipment brochures.
2. Six sets of shop drawings and one set of reproducibles.
3. Completed Louisiana State Fire Marshal's plan review form.
4. Check for review fee, if applicable.

E. If additional clarifying details and/or components are required by the Fire Marshal, Contractor shall prepare the details, provide components, and secure approval at no additional cost to the Owner. Installation shall not begin until the Fire Marshal's review is complete.

F. Operating instructions provided to the Owner shall include submittal brochure, shop drawings, and booklet including device addresses to match shop drawings, and control commands for doors, HVAC, elevators, etc.

G. If acceptable to the Fire Marshal in lieu of a full plan review, Contractor shall submit a letter of exemption with fee to the Architect for Fire Marshal review prior to beginning the installation.

PART 2 - PRODUCTS

2.1 FIRE ALARM SYSTEM

A. There is an existing fire alarm system that shall be reused and expanded as required. Contractor shall furnish and install smoke detectors, air-stream smoke detectors, monitor modules, control modules with relays, wiring and raceways, and all other equipment, whether specifically indicated or not, to provide a complete and operating addressable analog, non-coded, supervised fire alarm system expansion to meet the requirements of NFPA 72 and all other applicable Life Safety Codes.

B. Contractor shall provide wiring as recommended by the manufacturer and it shall be indicated in the point-to-point interconnection drawings that shall be included with the submittals. The completed installation is to conform to applicable sections of NFPA 72, local and state code requirements and the National Electrical Code. Entire system shall have battery backup to meet NFPA and local codes plus 20% spare capacity.

C. Air-stream smoke detectors shall be addressable analog detectors. Performance shall be as described for smoke detectors. A remote test station (with indicator light and keyed test switch on a single-gang plate to be engraved with associated air unit designation) shall be provided for each air-stream smoke detector. Each shall be in a flush outlet box at a location as directed (generally) in corridor wall near the detector (reuse existing outlet box, when possible), or at a readily accessible place in the associated mechanical room, unless a location is indicated on the drawings. Provide wiring in raceways from detector(s) to remote test station (test station shall not be addressable device with a different address than the detector). Provide an addressable control module with relay at the air handling system associated with each air-stream smoke detector and program the control module for fan/damper shutdown control resulting from activation of each detector associated with only that air handling system. However, in accordance with IBC and NFPA, when multiple air handling systems are associated with a common air plenum, fan/damper shutdown shall occur for all of these air handling systems upon activation of any air stream smoke detector associated with these air handling systems.

The control module shall be located within 2' of the starter or control panel. Provide wiring and raceways from control module relays to the mechanical control equipment (starters, control panels, etc.) for this control unless it is being done by the mechanical controls contractor. Air-stream smoke detectors shall be as follows:

1. Where air-stream to be sensed passes through a duct, the air-stream smoke detector shall be a duct type smoke detector with housing and air sampling tubes. These shall be located in accordance with NFPA 72 requirements with exact location to be coordinated with the Division 15 contractor. Multiple duct smoke detectors shall be provided at each location where ducts split into multiple ducts that cannot be monitored by a single detector. However, where an air-stream smoke detector is indicated to be installed in either the supply of an unconditioned outside air duct or located outside exposed to ambient air, a smoke detector shall be pendant-mounted inside the duct. The smoke detector shall be air-handling system rated (UL 268A) and shall be suited for high humidity and high velocity (minimum 2,000 feet-per-minute) environments. Coordinate with other trades to provide an access panel in duct to allow access to the smoke detector.

2. Where air-stream to be sensed does not pass through a duct (or the detector type indicated above is impractical), the air-stream smoke detector(s) shall be located in accordance with NFPA 72 Paragraphs 17.7.5.4.2 and A17.7.5.4.2 and shall be of the type (and quantity) suitable and UL listed for the application (including air velocity). Verify opening sizes which may require a large quantity of detectors.

D. Provide a small permanent label on each addressable device to indicate the address.

E. Provide addressable control modules (with relays as needed) at air handling systems (as hereinbefore indicated), and for other equipment as indicated on the drawings. Provide wiring in raceways from control modules to the equipment to be controlled; observe distance limitations required in NFPA 72. Provide custom programming as required.

F. Power supply panels shall be provided (in closets) as necessary and shall be provided with batteries and 120V circuits. A smoke detector shall be provided at each power supply panel.

G. Programming shall be provided as required.

PART 3 - EXECUTION

3.1 FIRE ALARM SYSTEM INSTALLATION

A. Wiring shall be provided as necessary for proper system operation and shall be of the type as recommended by system manufacturer. Wiring shall be contained in concealed raceways unless noted otherwise.

B. System shall be installed by a qualified fire alarm technician licensed by the State of Louisiana. Devices shall be individually tested. A final operational test shall be conducted on the entire system. After wiring and construction is completed, system shall be certified by equipment supplier in writing as being complete and properly operating. The certification letter shall include NFPA 72 forms.

C. Contractor shall meet with the Owner to establish name for each device address.

D. Contractor shall meet with the Owner (or security contractor) to properly program as required.

E. Provide 2 spare air-stream (duct type) smoke detectors to the Owner.

F. Install 2 additional monitor modules and 2 additional control modules with relays at locations as directed. Connect them to the system and to monitored and controlled devices. At end of construction, any of these modules not used shall be turned over to the Owner.

G. Contractor shall contact Fire Marshal and demonstrate system to him, as many times as required.

H. Contractor shall, at the completion of the project, arrange with equipment supplier to train designated Owner personnel in the proper operation, programming and minor maintenance of the system. This shall include training on programming to make changes in device addressing, to make other specified programming changes (to include changes to smoke detector sensitivity settings), and to generate system reports. [Training shall be minimum of 3 hours.

I. The completed systems shall be guaranteed free from electrical, mechanical, software, and/or operational defects for a period of one year.

-END OF SECTION -