STATE OF DELAWARE
APPOQUINIMINK SCHOOL DISTRICT

SPECIFICATIONS
FOR

ASD DISTRICT OFFICE
LOWER LEVEL RENOVATIONS

AT

118 S. SIXTH STREET
ODESSA, DELAWARE 19730

PREPARED
BY

R G ARCHITECTS, LLC.
200 WEST MAIN STREET
MIDDLETOWN, DELAWARE 19709
RGA PROJECT NO. #22017.4

ISSUED FOR BIDDING
1 OCTOBER 2024

STATE OF DELAWARE
APPOQUINIMINK SCHOOL DISTRICT

SPECIFICATIONS
FOR

ASD DISTRICT OFFICE
LOWER LEVEL RENOVATIONS

AT

118 S. SIXTH STREET
ODESSA, DELAWARE 19730

PREPARED
BY

R G ARCHITECTS, LLC.
200 WEST MAIN STREET
MIDDLETOWN, DELAWARE 19709
RGA PROJECT NO. #22017.4

ISSUED FOR BIDDING
1 OCTOBER 2024

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

A. Specifications for this project are arranged in accordance with the Construction Specification Institute numbering system and format. Section numbering is discontinuous and all numbers not appearing in the Table of Contents are not used for this Project.

B. DOCUMENTS BOUND HEREWITH

DIVISION 00 – PROCUREMENT AND CONTRACT REQUIREMENTS

INTRODUCTORY INFORMATION

00 01 01 PROJECT TITLE PAGE
00 01 07 SEALS PAGE
00 01 10 TABLE OF CONTENTS
00 01 15 LIST OF DRAWING SHEETS

PROCUREMENT REQUIREMENTS

00 11 16 INVITATION TO BID
00 21 13 INSTRUCTIONS TO BIDDERS
00 41 13 BID FORM
00 43 13 BID BOND

CONTRACTING REQUIREMENTS

00 52 13 STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR (SAMPLE A132-2019)
(SAMPLE AIA A132-2019 – EXHIBIT A)
00 54 13 SUPPLEMENT TO AGREEMENT BETWEEN OWNER AND CONTRACTOR A132-2019
00 54 14 SUPPLEMENT TO A132-2019 - EXHIBIT A - INSURANCE AND BONDS
00 61 13.13 PERFORMANCE BOND
00 61 13.16 PAYMENT BOND
00 62 76 APPLICATION AND CERTIFICATE FOR PAYMENT FORMS (SAMPLE AIA G732 & G703)
00 72 13 GENERAL CONDITIONS TO THE CONTRACT FOR CONSTRUCTION A232-2019 (SAMPLE AIA A232-2019)
00 73 13 SUPPLEMENTARY GENERAL CONDITIONS A232-2019
00 73 13.10 SCHEDULING GUIDELINES
00 73 46 PREVAILING WAGE RATE REQUIREMENTS
00 81 13 GENERAL REQUIREMENTS
00 81 14 DRUG TESTING FORMS
00 81 15 AFFIDAVIT OF CRAFT TRAINING COMPLIANCE

DIVISION 01 – GENERAL REQUIREMENTS

01 10 00 SUMMARY OF WORK
01 12 00-01A GENERAL SCOPE OF WORK
01 12 00-02A DEMOLITION
01 12 00-32A CONCRETE, MASONRY, SLAB CAULKING
01 12 00-08A GLASS
01 12 00-09A GENERAL TRADES
01 12 00-09B FLOORING

01 12 00-09C PAINTING
01 12 00-12A ROLLER SHADES
~~01 12 00-12B CASEWORK~~
01 12 00-22A PLUMBING / HVAC
01 12 00-26A ELECTRICAL
01 21 00 ALLOWANCES
01 21 16 ALLOWANCE AUTHORIZATION FORM
01 23 00 ALTERNATES
01 25 00 SUBSTITUTION PROCEDURES
01 26 00 CONTRACT MODIFICATION PROCEDURES
01 26 50 CHANGE ORDER REQUEST SUBMISSION FORMAT
01 29 00 PAYMENT PROCEDURES
01 30 00 ADMINISTRATIVE REQUIREMENTS
01 31 00 PROJECT MANAGEMENT AND COORDINATION
01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
01 32 10 CONSTRUCTION SCHEDULE
01 32 33 PHOTOGRAPHIC DOCUMENTATION
01 33 00 SUBMITTAL PROCEDURES
01 33 01 SUBMITTAL COVER SHEET FORM
01 35 00 SPECIAL PROJECT PROCEDURES
01 35 20 EH&S PLAN (WT EH&S PLAN)
01 36 00 QUALITY MANAGEMENT PLAN
01 40 00 QUALITY REQUIREMENTS
01 50 00 TEMPORARY FACILITIES AND CONTROLS
01 60 00 PRODUCT REQUIREMENTS
01 73 00 EXECUTION
01 73 29 CUTTING AND PATCHING
01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 77 00 CLOSEOUT PROCEDURES
01 77 50 G706-1994 CONTRACTORS AFFIDAVIT OF PAYMENY DEBTS AND CLAIMS
01 77 50 G706A-1994 CONTRACTORS AFFIDAVIT OF RELEASE OF LIENS
01 77 50 G707-1994 CONSENT OF SURETY TO FINAL PAYMENT
01 78 39 PROJECT RECORD DOCUMENTS

DIVISION 02 - EXISTING CONDITIONS

02 41 19 SELECTIVE DEMOLITION

DIVISION 03 – CONCRETE

03 30 00 CAST-IN-PLACE CONCRETE

DIVISION 04 – MASONRY

04 01 20.63 BRICK MASONRY REPAIR

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

06 10 00 ROUGH CARPENTRY

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 92 00 JOINT SEALANTS

DIVISION 08 – OPENINGS

08 11 13 HOLLOW METAL DOORS & FRAMES
08 14 16 FLUSH WOOD DOORS
08 41 13 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
08 71 00 DOOR HARDWARE

DIVISION 09 – FINISHES

09 22 16 NON-STRUCTURAL METAL FRAMING
09 29 00 GYPSUM BOARD
09 51 13 ACOUSTICAL PANEL CEILINGS
09 65 13 RESILIENT BASE AND ACCESSORIES
09 65 52 LUXURY VINYL PLANK AND TILE FLOORING
09 68 13 TILE CARPETING
09 91 00 PAINTING (MPI)

DIVISION 10 – SPECIALTIES
10 14 23 PANEL SIGNAGE
10 21 13 PLASTIC TOILET COMPARTMENTS
10 28 00 TOILET, BATH & LAUNDRY ACCESSORIES
10 44 13 FIRE PROTECTION CABINETS
10 44 16 FIRE EXTINGUISHERS

DIVISION 12 – FURNISHINGS

12 24 13 ROLLER SHADES
12 32 00 MODULAR CASEWORK
12 36 16 QUARTZ AGGLOMERATE COUNTERTOPS

DIVISION 22 – PLUMBING

22 00 00 GENERAL PROVISIONS – PLUMBING
22 00 10 BASIC MATERIALS AND METHODS – PLUMBING
22 00 30 INSULATION AND COVERING – PLUMBING
22 01 10 DRAINAGE SYSTEMS – PLUMBING
22 01 20 DOMESTIC WATER SYSTEMS – PLUMBING
22 01 90 TESTING - PLUMBING

DIVISION 23 – HVAC

23 02 00 GENERAL PROVISIONS – HVAC
23 02 10 BASIC MATERIALS AND METHODS – HVAC
23 02 15 VALVES
23 02 30 INSULATING AND COVERING – HVAC
23 04 50 REFRIGERATION EQUIPMENT – HVAC
23 06 00 AIR DISTRIBUTION & ACCESSORIES – HVAC
23 09 00 AUTOMATIC TEMPERATURE CONTROLS (DDC)

23 09 50 TESTING & BALANCING OF MECHANICAL SYSTEMS

DIVISION 26 - ELECTRICAL

26 00 00 GENERAL PROVISIONS – ELECTRICAL
26 00 55 ELECTRICAL IDENTIFICATION
26 01 10 RACEWAYS
26 01 20 WIRES AND CABLES
26 01 21 WIRE CONNECTIONS AND DEVICES
26 01 35 ELECTRICAL BOXES AND FITTINGS
26 01 40 WIRING DEVICES
26 01 70 MOTOR AND CIRCUIT DISCONNECTS
26 01 80 OVERCURRENT PROTECTIVE DEVICES
26 01 90 SUPPORTING DEVICES
26 04 72 BRANCH CIRCUITS
26 05 10 BUILDING LIGHTING
26 07 40 NETWORK CABLING SYSTEMS (DCET) STATE

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF DRAWING SHEETS

00.1 COVER SHEET

00.2 PROJECT NOTES, SYMBOLS & ABBREVIATIONS

ARCHITECTURAL

00.3 PROJECT OVERVIEW

00.4 CODE PLAN

00.5 ACCESSIBILITY PLAN

a0.1 WALL TYPES & TYPICAL DETAILS

a1.0 LOWER FLOOR: DEMOLITION FLOOR PLANS

a1.1 LOWER FLOOR: RENOVATION FLOOR PLANS

a1.1c LOWER FLOOR: CEILING PLAN

a2.1 BUILDING ELEVATIONS

a3.1 PARTIAL BUILDING SECTIONS

a3.2 PARTIAL BUILDING SECTIONS

a4.1 DOOR SCHEDULE & DOOR/WINDOW ELEVATIONS

a4.2 DOOR & WINDOW DETAILS

a5.1 TOILET ROOM ENLARGED PLANS

a5.2 TOILET ROOM ELEVATIONS

a8.1 FINISH PLAN

a8.2 FURNITURE PLAN

MEP

MD1.1 LOWER FLOOR: DEMOLITION MECHANICAL

M1.1 LOWER FLOOR: RENOVATION MECHANICAL

M2.1 SCHEDULES & DETAILS MECHANICAL

P1.1 LOWER FLOOR: DEMOLITION & RENOVATION PLUMBING

P1.2 LOWER FLOOR: DEMOLITION & RENOVATION PLUMBING

E1.1 LOWER FLOOR: DEMOLITION & RENOVATION LIGHTING

E1.2 LOWER FLOOR: DEMOLTION & RENOVATION POWER

E2.1 SCHEDULES & DETAILS ELECTRICAL

SEALS PAGE

1.1 DESIGNS PROFESSIONALS OF RECORD

SEAL

A. ARCHITECT:

1. ROBERT A GROVE, AIA
2. (LICENSE #S5-08320)
3. R G ARCHITECTS, LLC.
4. 200 W. MAIN STREET
   MIDDLETOWN, DE 19709
5. (302) 376-8100
6. Responsible for Division 01-49 Sections except where indicated as prepared by other design professionals of record.

B. PLUMBING, MECHANICAL, ELECTRICAL ENGINEER:

1. SHIRLEY A. JOHNSON, P.E., C.E.M.
2. (LICENSE # 12721)
3. FURLOW ASSOCIATES, INC.
4. 650 NAAMANS ROAD
   SUITE 211
   CLAYMONT, DE 19703
5. (302) 798.3515
6. Responsible for Division 21-28 Sections except where indicated as prepared by other design professionals of record.

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 00 11 16 – INVITATION TO BID

Sealed bids for Appoquinimink School District Office Renovations will be received by the Appoquinimink School District at **118 South Sixth St. Odessa, DE 19730 on April 4th, at 2:00pm** at which time they will be publicly opened and read aloud. Bidder bears the risk of late delivery. Any bids received after the stated time will be returned unopened. Below are the bid packages being offered:

09A General Trades
23A Plumbing, HVAC, and Controls
26A Electrical

Attention is called to construction schedule as detailed in the Bid Documents.

The project scope of work consists of, interior renovations and expanding portions of the existing office space. Interior renovations include the demolition of interior walls, ceiling systems, doors, mechanical, electrical & plumbing fixtures, and the construction of new walls, ceilings, fixtures & finishes.

A Pre-Bid Meeting will be held on **March 10th, 2025, at 11:00am** at the Project location for the purpose of answering any questions. Attendance at this meeting is encouraged, but not mandatory for contractors wishing to submit a bid.

Sealed bids shall be addressed to the Appoquinimink School District, ATTN: Keith Hopkins, Construction Project Manager, 118 South Sixth Street. Odessa, DE 19730. The outer envelope should clearly indicate: "ASD DISTRICT OFFICE – LOWER LEVEL RENOVATIONS – SEALED BID – DO NOT OPEN."

Electronic Versions (PDF) of the Contract documents may be obtained by contacting the offices of **R G Architects, LLC**, phone (302) 376-8100, or emailing: **jack@rgarchitects.net.**

Construction documents will be available for review at the office of R G Architects, LLC, 200 West Main Street, Middletown, Delaware 19709.

Bidders will not be subject to discrimination on the basis of race, creed, color, sex, sexual orientation, gender identity or national origin in consideration of this award, and Minority Business Enterprises, Disadvantaged Business Enterprises, Women-Owned Business
Enterprises and Veteran-Owned Business Enterprises will be afforded full opportunity to submit bids on this contract. Each bid must be accompanied by a bid security equivalent to ten percent of the bid amount and all additive alternates. The successful bidder must post a performance bond and payment bond in a sum equal to 100 percent of the contract price upon execution of the contract. The Owner reserves the right to reject any or all bids and to waive any informalities therein. The Owner may extend the time and place for the opening of the bids from that described in the advertisement, with not less than two calendar days notice by certified delivery, facsimile machine or other electronic means to those bidders receiving plans.

END OF ADVERTISEMENT FOR BIDS

END OF SECTION 00 11 16

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

TABLE OF ARTICLES

1. GENERAL

2. BIDDER'S REPRESENTATION

3. BIDDING DOCUMENTS

4. BIDDING PROCEDURES

5. CONSIDERATION OF BIDS

6. POST-BID INFORMATION

7. PERFORMANCE BOND AND PAYMENT BOND

8. FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

ARTICLE 1: GENERAL

1.1 DEFINITIONS

1.1.1 Whenever the following terms are used, their intent and meaning shall be interpreted as follows:

1.2 STATE: The State of Delaware.

1.3 AGENCY: Contracting State Agency as noted on cover sheet.

1.4 DESIGNATED OFFICIAL: The agent authorized to act for the Agency.

1.5 BIDDING DOCUMENTS: Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement for Bid, Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the Bid Form (including the Non-collusion Statement), and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, as well as the Drawings, Specifications (Project Manual) and all Addenda issued prior to execution of the Contract.

1.6 CONTRACT DOCUMENTS: The Contract Documents consist of the, Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the form of agreement between the Owner and the Contractor, Drawings (if any), Specifications (Project Manual), and all addenda.

1.7 AGREEMENT: The form of the Agreement shall be AIA Document A101, Standard Form of Agreement between Owner and Contractor where the basis of payment is a STIPULATED SUM. In the case of conflict between the instructions contained therein and the General Requirements herein, these General Requirements shall prevail.

1.8 GENERAL REQUIREMENTS (or CONDITIONS): General Requirements (or conditions) are instructions pertaining to the Bidding Documents and to contracts in general. They contain, in summary, requirements of laws of the State; policies of the Agency and instructions to bidders.

1.9 SPECIAL PROVISIONS: Special Provisions are specific conditions or requirements peculiar to the bidding documents and to the contract under consideration and are supplemental to the General Requirements. Should the Special Provisions conflict with the General Requirements, the Special Provisions shall prevail.

1.10 ADDENDA: Written or graphic instruments issued by the Owner/Architect prior to the execution of the contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

1.11 BIDDER OR VENDOR: A person or entity who formally submits a Bid for the material or Work contemplated, acting directly or through a duly authorized representative who meets the requirements set forth in the Bidding Documents.

1.12 SUB-BIDDER: A person or entity who submits a Bid to a Bidder for materials or labor, or both for a portion of the Work.

1.13 BID: A complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

1.14 BASE BID: The sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids (if any are required to be stated in the bid).

1.15 ALTERNATE BID (or ALTERNATE): An amount stated in the Bid, where applicable, to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents is accepted.

1.16 UNIT PRICE: An amount stated in the Bid, where applicable, as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

1.17 SURETY: The corporate body which is bound with and for the Contract, or which is liable, and which engages to be responsible for the Contractor's payments of all debts pertaining to and for his acceptable performance of the Work for which he has contracted.

1.18 BIDDER'S DEPOSIT: The security designated in the Bid to be furnished by the Bidder as a guaranty of good faith to enter into a contract with the Agency if the Work to be performed or the material or equipment to be furnished is awarded to him.

1.19 CONTRACT: The written agreement covering the furnishing and delivery of material or work to be performed.

1.20 CONTRACTOR: Any individual, firm or corporation with whom a contract is made by the Agency.

1.21 SUBCONTRACTOR: An individual, partnership or corporation which has a direct contract with a contractor to furnish labor and materials at the job site, or to perform construction labor and furnish material in connection with such labor at the job site.

1.22 CONTRACT BOND: The approved form of security furnished by the contractor and his surety as a guaranty of good faith on the part of the contractor to execute the work in accordance with the terms of the contract.

1.23 CUSTOM FABRICATION: As defined in 29 Del. C. § 6902, the term “custom fabrication” means the offsite fabrication, assembly, or other production of non-standard goods or materials, including components, fixtures or parts thereof, specifically for a public works project. Such goods and materials shall include those used in the following trades or systems: (1) Plumbing or pipe fitting systems, including heating, ventilating, air-conditioning, refrigeration systems, sheet metal or other duct systems; (2) Electrical systems; (3) Mechanical insulation work; (4) Ornamental iron work; and (5) Commercial signage that does not attempt or appear to direct the movement of traffic on highways or roadways or interfere with, imitate, or resemble any official traffic sign, signal or device.

ARTICLE 2: BIDDER'S REPRESENTATION

2.1 PRE-BID MEETING

2.1.1 A pre-bid meeting for this project will be held at the time and place designated. Attendance at this meeting is a pre-requisite for submitting a Bid, unless this requirement is specifically waived elsewhere in the Bid Documents.

2.2 By submitting a Bid, the Bidder represents that:

2.2.1 The Bidder has read and understands the Bidding Documents and that the Bid is made in accordance therewith.

2.2.2 The Bidder has visited the site, become familiar with existing conditions under which the Work is to be performed, and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

2.2.3 The Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception.

2.3 JOINT VENTURE REQUIREMENTS

2.3.1 For Public Works Contracts, each Joint Venturer shall be qualified and capable to complete the Work with their own forces.

2.3.2 Included with the Bid submission, and as a requirement to bid, a copy of the executed Joint Venture Agreement shall be submitted and signed by all Joint Venturers involved.

2.3.3 All required Bid Bonds, Performance Bonds, Material and Labor Payment Bonds must be executed by both Joint Venturers and be placed in both of their names.

2.3.4 All required insurance certificates shall name both Joint Venturers.

2.3.5 Both Joint Venturers shall sign the Bid Form.

2.3.6 Both Joint Venturers shall include their Federal E.I. Number with the Bid.

2.3.7 In the event of a mandatory Pre-bid Meeting, each Joint Venturer shall have a representative in attendance.

2.3.8 Due to exceptional circumstances and for good cause shown, one or more of these provisions may be waived at the discretion of the State.

2.4 ASSIGNMENT OF ANTITRUST CLAIMS

2.4.1 As consideration for the award and execution by the Owner of this contract, the Contractor hereby grants, conveys, sells, assigns and transfers to the State of Delaware all of its right, title and interests in and to all known or unknown causes of action it presently has or may now or hereafter acquire under the antitrust laws of the United States and the State of Delaware, relating to the particular goods or services purchased or acquired by the Owner pursuant to this contract.

ARTICLE 3: BIDDING DOCUMENTS

3.1 COPIES OF BID DOCUMENTS

3.1.1 Bidders may obtain complete sets of the Bidding Documents from the Architectural/Engineering firm designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein.

3.1.2 Bidders shall use complete sets of Bidding Documents for preparation of Bids. The issuing Agency nor the Architect assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

3.1.3 Any errors, inconsistencies or omissions discovered shall be reported to the Architect immediately.

3.1.4 The Agency and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall report any errors, inconsistencies, or ambiguities discovered to the Architect.

3.2.2 Bidders or Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Architect at least seven days prior to the date for receipt of Bids. Interpretations, corrections and changes to the Bidding Documents will be made by written Addendum. Interpretations, corrections, or changes to the Bidding Documents made in any other manner shall not be binding.

3.2.3 The apparent silence of the specifications as to any detail, or the apparent omission from it of detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and only material and workmanship of the first quality are to be used. Proof of specification compliance will be the responsibility of the Bidder.

3.2.4 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all permits, labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work.

3.2.5 The Owner will bear the costs for all impact and user fees associated with the project.

3.3 SUBSTITUTIONS

3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of quality, required function, dimension, and appearance to be met by any proposed substitution. The specification of a particular manufacturer or model number is not intended to be proprietary in any way. Substitutions of products for those named will be considered, providing that the Vendor certifies that the function, quality, and performance characteristics of the material offered is equal or superior to that specified. It shall be the Bidder's responsibility to assure that the proposed substitution will not affect the intent of the design, and to make any installation modifications required to accommodate the substitution.

3.3.2 Requests for substitutions shall be made in writing to the Architect at least ten days prior to the date of the Bid Opening. Such requests shall include a complete description of the proposed substitution, drawings, performance and test data, explanation of required installation modifications due the substitution, and any other information necessary for an evaluation. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect’s decision of approval or disapproval shall be final. The Architect is to notify Owner prior to any approvals.

3.3.3 If the Architect approves a substitution prior to the receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding.

3.3.4 The Architect shall have no obligation to consider any substitutions after the Contract award.

3.4 ADDENDA

3.4.1 Addenda will be mailed or delivered to all who are known by the Architect to have received a complete set of the Bidding Documents.

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

3.4.3 No Addenda will be issued later than 2 calendar days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which extends the time or changes the location for the opening of bids.

3.4.4 Each bidder shall ascertain prior to submitting his Bid that they have received all Addenda issued, and shall acknowledge their receipt in their Bid in the appropriate space. Not acknowledging an issued Addenda could be grounds for determining a bid to be non-responsive.

ARTICLE 4: BIDDING PROCEDURES

4.1 PREPARATION OF BIDS

4.1.1 Submit the bids on the Bid Forms included with the Bidding Documents.

4.1.2 Submit the original Bid Form for each bid. Bid Forms may be removed from the project manual for this purpose.

4.1.3 Execute all blanks on the Bid Form in a non-erasable medium (typewriter or manually in ink).

4.1.4 Where so indicated by the makeup on the Bid Form, express sums in both words and figures, in case of discrepancy between the two, the written amount shall govern.

4.1.5 Interlineations, alterations or erasures must be initialed by the signer of the Bid.

4.1.6 BID ALL REQUESTED ALTERNATES AND UNIT PRICES, IF ANY. If there is no change in the Base Bid for an Alternate, enter “No Change”. The Contractor is responsible for verifying that they have received all addenda issued during the bidding period. Work required by Addenda shall automatically become part of the Contract.

4.1.7 Make no additional stipulations on the Bid Form and do not qualify the Bid in any other manner.

4.1.8 Each copy of the Bid shall include the legal name of the Bidder and a statement whether the Bidder is a sole proprietor, a partnership, a corporation, or any legal entity, and each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current Power of Attorney attached, certifying agent's authority to bind the Bidder.

4.1.9 Bidder shall complete the Non-Collusion Statement form included with the Bid Forms and include it with their Bid.

4.1.10 In the construction of all Public Works projects for the State of Delaware or any agency thereof, preference in employment of laborers, workers or mechanics shall be given to bona fide legal citizens of the State who have established citizenship by residence of at least 90 days in the State.

4.1.11 Each bidder shall include a signed Affidavit for the Bidder certifying compliance with OMB Regulation 4104 - "Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on "Large Public Works Projects." "Large Public Works" is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.

4.2 BID SECURITY

4.2.1 All bids shall be accompanied by a deposit of either a good and sufficient bond to the agency for the benefit of the agency, with corporate surety authorized to do business in this State, the form of the bond and the surety to be approved by the agency, or a security of the bidder assigned to the agency, for a sum equal to at least 10% of the bid plus all add alternates, or in lieu of the bid bond a security deposit in the form of a certified check, bank treasurer's check, cashier's check, money order, or other prior approved secured deposit assigned to the State. The bid bond need not be for a specific sum, but may be stated to be for a sum equal to 10% of the bid plus all add alternates to which it relates and not to exceed a certain stated sum, if said sum is equal to at least 10% of the bid. The Bid Bond form used shall be the standard OMB form (attached).

4.2.2 The Agency has the right to retain the bid security of Bidders to whom an award is being considered until either a formal contract has been executed and bonds have been furnished or the specified time has elapsed so the Bids may be withdrawn or all Bids have been rejected.

4.2.3 In the event of any successful Bidder refusing or neglecting to execute a formal contract and bond within 20 days of the awarding of the contract, the bid bond or security deposited by the successful bidder shall be forfeited.

4.3 SUBCONTRACTOR LIST

4.3.1 In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, each Bidder shall submit with their Bid a completed List of Sub-Contractors included with the Bid Form. NAME ONLY ONE SUBCONTRACTOR FOR EACH TRADE. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the Bidder will be using to perform the work and provide material for that subcontractor category. Should the Bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the Bidder shall list that third-tier contractor's full name and address (City & State). **If the Bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the Bidder intends to perform the work themselves, the Bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition

in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

4.3.2 It is the responsibility of the Contractor to ensure that their Subcontractors are in compliance with the provisions of this law. Also, if a Contractor elects to list themselves as a Subcontractor for any category, they must specifically name themselves on the Bid Form and be able to document their capability to act as Subcontractor in that category in accordance with this law.

4.4 AFFIDAVIT OF CONTRACTOR QUALIFICATIONS

4.4.1 In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, each Bidder shall submit with their Bid the Affidavit of Contractor Qualifications certifying that the Bidder will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term. After a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

4.5 AFFIDAVIT OF CRAFT TRAINING COMPLIANCE

4.5.1 In accordance with Title 29, Chapter 69, Section 6962(c)(13) of the Delaware Code, contractors and subcontractors must provide craft training for journeyman and apprentice levels if **all** of the following apply:

A. A project meets the prevailing wage requirement under Title 29, Chapter 69, Section 6960 of the Delaware Code.
B. The contractor employs 10 or more total employees.
C. The project is not a federal highway project

Failure to provide required craft training on the project may subject the successful contractor and/or subcontractor(s) to penalties as outlined in Title 29, Chapter 69, Section 6962(c)(13) of the Delaware Code.

Bidders shall submit the Affidavit of Craft Training Compliance prior to contract execution.

4.6 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

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

A. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, sex, color, sexual orientation, gender identity or national origin. The Contractor will take affirmative action to ensure the applicants are employed, and that employees are treated during employment, without regard to their race, creed, sex, color, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

B. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, sex, color, sexual orientation, gender identity or national origin."

4.7 PREVAILING WAGE REQUIREMENT

4.7.1 Wage Provisions: For renovation and new construction projects whose costs exceed the thresholds contained in Delaware Code, Title 29, Section 6960, the minimum wage rates for various classes of laborers and mechanics shall be as determined by the Department of Labor, Division of Industrial Affairs of the State of Delaware.

4.7.2 The employer shall pay all mechanics and labors employed directly upon the site of work, or engaged in custom fabrication work, as that term is defined in Article 1.23 herein and as also as defined in 29 Del. C § 6902 and described in 29 Del. C. § 6960(b), regardless of where the work is performed, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the specifications, regardless of any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics.

4.7.3 As per 29 Del. C. § 6960(b), the scale of the wages to be paid must be posted by the employer in a prominent and easily accessible place at the site of the work. There may be withheld from the employer so much of accrued payments as may be considered necessary by the Department of Labor to pay laborers and mechanics employed by the employer the difference between the rates of wages required by the contract to be paid laborers and mechanics on the work and rates of wages received by such laborers and mechanics to be remitted to the Department of Labor for distribution upon resolution of any claims.

4.7.4 Every contract based upon these specifications shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly. The Department of Labor shall keep and maintain the sworn payroll information for a period of 6 months from the last day of the work week covered by the payroll.

4.8 SUBMISSION OF BIDS

4.8.1 Enclose the Bid, the Bid Security, and any other documents required to be submitted with the Bid in a sealed opaque envelope. Address the envelope to the party receiving the Bids. Identify with the project name, project number, and the Bidder's name and address. If the Bid is sent by mail, enclose the sealed envelope in a separate mailing envelope with the notation "BID ENCLOSED" on the face thereof. The State is not responsible for the opening of bids prior to bid opening date and time that are not properly marked.

4.8.2 Deposit Bids at the designated location prior to the time and date for receipt of bids indicated in the Advertisement for Bids. Bids received after the time and date for receipt of bids will be marked “LATE BID” and returned.

4.8.3 Bidder assumes full responsibility for timely delivery at location designated for receipt of bids.

4.8.4 Oral, telephonic or telegraphic bids are invalid and will not receive consideration.

4.8.5 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids, provided that they are then fully in compliance with these Instructions to Bidders.

4.9 MODIFICATION OR WITHDRAW OF BIDS

4.9.1 Prior to the closing date for receipt of Bids, a Bidder may withdraw a Bid by personal request and by showing proper identification to the Architect. A request for withdraw by letter or fax, if the Architect is notified in writing prior to receipt of fax, is acceptable. A fax directing a modification in the bid price will render the Bid informal, causing it to be ineligible for consideration of award. Telephone directives for modification of the bid price shall not be permitted and will have no bearing on the submitted proposal in any manner.

4.9.2 Bidders submitting Bids that are late shall be notified as soon as practicable and the bid shall be returned.

4.9.3 A Bid may not be modified, withdrawn or canceled by the Bidder during a thirty (30) day period following the time and date designated for the receipt and opening of Bids, and Bidder so agrees in submitting their Bid. Bids shall be binding for 30 days after the date of the Bid opening.

ARTICLE 5: CONSIDERATION OF BIDS

5.1 OPENING/REJECTION OF BIDS

5.1.1 Unless otherwise stated, Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids will be made available to Bidders.

5.1.2 The Agency shall have the right to reject any and all Bids. A Bid not accompanied by a required Bid Security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

5.1.3 If the Bids are rejected, it will be done within thirty (30) calendar day of the Bid opening.

5.2 COMPARISON OF BIDS

5.2.1 After the Bids have been opened and read, the bid prices will be compared and the result of such comparisons will be made available to the public. Comparisons of the Bids may be based on the Base Bid plus desired Alternates. The Agency shall have the right to accept Alternates in any order or combination.

5.2.2 The Agency reserves the right to waive technicalities, to reject any or all Bids, or any portion thereof, to advertise for new Bids, to proceed to do the Work otherwise, or to abandon the Work, if in the judgment of the Agency or its agent(s), it is in the best interest of the State.

5.2.3 An increase or decrease in the quantity for any item is not sufficient grounds for an increase or decrease in the Unit Price.

5.2.4 The prices quoted are to be those for which the material will be furnished F.O.B. Job Site and include all charges that may be imposed during the period of the Contract.

5.2.5 No qualifying letter or statements in or attached to the Bid, or separate discounts will be considered in determining the low Bid except as may be otherwise herein noted. Cash or separate discounts should be computed and incorporated into Unit Bid Price(s).

5.3 DISQUALIFICATION OF BIDDERS

5.3.1 An agency shall determine that each Bidder on any Public Works Contract is responsible before awarding the Contract. Factors to be considered in determining the responsibility of a Bidder include:

A. The Bidder's financial, physical, personnel or other resources including Subcontracts;

B. The Bidder's record of performance on past public or private construction projects, including, but not limited to, defaults and/or final adjudication or admission of violations of the Prevailing Wage Laws in Delaware or any other state;

C. The Bidder's written safety plan;

D. Whether the Bidder is qualified legally to contract with the State;

E. Whether the Bidder supplied all necessary information concerning its responsibility; and,

F. Any other specific criteria for a particular procurement, which an agency may establish; provided however, that, the criteria be set forth in the Invitation to Bid and is otherwise in conformity with State and/or Federal law.

5.3.2 If an agency determines that a Bidder is nonresponsive and/or nonresponsible, the determination shall be in writing and set forth the basis for the determination. A copy of the determination shall be sent to the affected Bidder within five (5) working days of said determination.

5.3.3 In addition, any one or more of the following causes may be considered as sufficient for the disqualification of a Bidder and the rejection of their Bid or Bids.

5.3.3.1 More than one Bid for the same Contract from an individual, firm or corporation under the same or different names.

5.3.3.2 Evidence of collusion among Bidders.

5.3.3.3 Unsatisfactory performance record as evidenced by past experience.

5.3.3.4 If the Unit Prices are obviously unbalanced either in excess or below reasonable cost analysis values.

5.3.3.5 If there are any unauthorized additions, interlineation, conditional or alternate bids or irregularities of any kind which may tend to make the Bid incomplete, indefinite or ambiguous as to its meaning.

5.3.3.6 If the Bid is not accompanied by the required Bid Security and other data required by the Bidding Documents.

5.3.3.7 If any exceptions or qualifications of the Bid are noted on the Bid Form.

5.4 ACCEPTANCE OF BID AND AWARD OF CONTRACT

5.4.1 A formal Contract shall be executed with the successful Bidder within twenty (20) calendar days after the award of the Contract.

5.4.2 Per Section 6962(d)(13)a., Title 29, Delaware Code, "The contracting agency shall award any public works contract within thirty (30) days of the bid opening to the lowest responsive and responsible Bidder, unless the Agency elects to award on the basis of best value, in which case the election to award on the basis of best value shall be stated in the Invitation To Bid. Any public school district and its board shall award public works contracts in accordance with this section's requirements except it shall award the contract within 60 days of the bid opening."

5.4.3 Each Bid on any Public Works Contract must be deemed responsive by the Agency to be considered for award. A responsive Bid shall conform in all material respects to the requirements and criteria set forth in the Contract Documents and specifications.

5.4.4 The Agency shall have the right to accept Alternates in any order or combination, and to determine the low Bidder on the basis of the sum of the Base Bid, plus accepted Alternates.

5.4.5 The successful Bidder shall execute a formal contract, submit the required Insurance Certificate, and furnish good and sufficient bonds, unless specifically waived in the General Requirements, in accordance with the General Requirement, within twenty (20) days of official notice of contract award. The successful Bidder shall provide, at least two business days prior to contract execution, copies of the Employee Drug Testing Program for the Bidder and all listed Subcontractors. Bonds shall be for the benefit of the Agency with surety in the amount of 100% of the total contract award. Said Bonds shall be conditioned upon the faithful performance of the contract. Bonds shall remain in affect for period of two (2) years after the date of the Certificate of Final Payment.

5.4.6 If the successful Bidder fails to execute the required Contract, Bond and all required information, as aforesaid, within twenty (20) calendar days after the date of official Notice of the Award of the Contract, their Bid guaranty shall immediately be taken and become the property of the State for the benefit of the Agency as liquidated damages, and not as a forfeiture or as a penalty. Award will then be made to the next lowest qualified Bidder of the Work or readvertised, as the Agency may decide.

5.4.7 Each bidder shall supply with its bid its taxpayer identification number (i.e., federal employer identification number or social security number) and should the vendor be awarded a contract, such vendor shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

5.4.8 The Bid Security shall be returned to the successful Bidder upon the execution of the formal contract. The Bid Securities of unsuccessful bidders shall be returned within thirty (30) calendar days after the opening of the Bids.

ARTICLE 6: POST-BID INFORMATION

6.1 CONTRACTOR'S QUALIFICATION STATEMENT

6.1.1 Bidders to whom an award of a Contract is under consideration shall, if requested by the Agency, submit a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a statement has been previously required and submitted.

6.2 Bidders to whom an award of a Contract has been made must produce their Delaware Business License before the Contract can be executed.

ARTICLE 7: PERFORMANCE BOND AND PAYMENT BOND

7.1 BOND REQUIREMENTS

7.1.1 The cost of furnishing the required Bonds, that are stipulated in the Bidding Documents, shall be included in the Bid.

7.1.2 If the Bidder is required by the Agency to secure a bond from other than the Bidder's usual sources, changes in cost will be adjusted as provide in the Contract Documents.

7.1.3 The Performance and Payment Bond forms used shall be the standard OMB forms (attached).

7.2 TIME OF DELIVERY AND FORM OF BONDS

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

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

ARTICLE 8: FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

8.1 Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment is a Stipulated Sum.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 00 40 13 – BID FORM

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

For Bids Due: **April 4th, 2025** **To:** Appoquinimink School District
118 South Sixth Street
Odessa, DE 19730

Bid Package: **ASD-09A General Trades**

Name of Bidder: _____

Delaware Business License No.: _____ **Taxpayer ID No.:** _____

(Other License Nos.): _____

Phone No.: ( ) _____ - _____ **Fax No.: ( ) _____ - _____**

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

$_____
($)

ALTERNATES

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

ALTERNATE NO. 1: Deduct the window walls shown
Add / Deduct: _____ Dollars
($) (in numbers)

ALTERNATE NO. 2: Deduct new coffee bar area.
Add / Deduct: _____ Dollars
($) (in numbers)

ALTERNATE NO. 3: New AHU as shown.

Add / Deduct: _____ Dollars

($) (in numbers)

ALTERNATE NO. 4: Furnish and install new ACT ceilings in first floor bathrooms, using Ceramaguard moisture resistant tile.

Add / Deduct: _____ Dollars

($) (in numbers)

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

UNIT PRICES

Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

	ADD	DEDUCT
UNIT PRICE No. 1: n/a	$	$

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids (60 days for School Districts and Department of Education), and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work as per the project schedule located in specification section 01 32 10.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

_____
(State of Corporation)

Business Address: _____
_____
_____
_____

Witness: _____ **By:** _____
(Authorized Signature)

(SEAL)

_____
(Title)

Date: _____

ATTACHMENTS

Sub-Contractor List
Non-Collusion Statement
Affidavit of Employee Drug Testing Program
Affidavit of Contractor Qualifications
Bid Security

(Others as Required by Project Manuals)

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, the following subcontractor listing must accompany any bid submittal. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the bidder will be using to perform the work and provide material for that subcontractor category. Should the bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the bidder shall list that third-tier contractor's full name and address (City & State). **If the bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the bidder intends to perform the work themselves, the bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

Subcontractor Category	Subcontractor	Address (City & State)	Subcontractors tax-payer ID # or Delaware Business license #
1. EIFS	_____	_____	_____

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date *(to the Office of Management and Budget, Division of Facilities Management)*.

All the terms and conditions of *ASD District Office Renovations* have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

_____

_____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors, that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

AFFIDAVIT
OF
CONTRACTOR QUALIFICATIONS

We hereby certify that we will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term.

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, after a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

Contractor Name: _____

Contractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

END OF SECTION

SECTION 00 40 13 – BID FORM

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

For Bids Due: **April 4th, 2025** **To:** Appoquinimink School District
118 South Sixth Street
Odessa, DE 19730

Bid Package: **ASD-23A Plumbing, HVAC, and Controls**

Name of Bidder: _____

Delaware Business License No.: _____ **Taxpayer ID No.:** _____

(Other License Nos.): _____

Phone No.: ( ) _____ - _____ **Fax No.:** ( ) _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

$_____
($)

ALTERNATES

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

ALTERNATE NO. 1: N/A
Add / Deduct: _____ Dollars
($) (in numbers)

ALTERNATE NO. 2: Deduct new coffee bar area.
Add / Deduct: _____ Dollars
($) (in numbers)

ALTERNATE NO. 3: New AHU as shown. Include costs to haul off all equipment and debris 100%. Include any and all re-balance work as well as control work necessary for proper operation.

Add / Deduct: _____ Dollars

($) (in numbers)

ALTERNATE NO. 4: N/A

Add / Deduct: _____ Dollars

($) (in numbers)

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

ALLOWANCE

Include in your base bid the following FULL allowance costs, including all supervision, overhead and profit, etc. Monies not used will be credited back at end of work:

Allowance No.1: include $5,000, to be used T&M for misc work.

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids (60 days for School Districts and Department of Education), and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work as per the project schedule located in specification section 01 32 10.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

_____
(State of Corporation)

Business Address: _____
_____
_____
_____

Witness: _____ **By:** _____
(Authorized Signature)

(SEAL)

_____
(Title)

Date: _____

ATTACHMENTS

Sub-Contractor List
Non-Collusion Statement
Affidavit of Employee Drug Testing Program
Affidavit of Contractor Qualifications
Bid Security
(Others as Required by Project Manuals)

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, the following subcontractor listing must accompany any bid submittal. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the bidder will be using to perform the work and provide material for that subcontractor category. Should the bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the bidder shall list that third-tier contractor's full name and address (City & State). **If the bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the bidder intends to perform the work themselves, the bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

Subcontractor Category	Subcontractor	Address (City & State)	Subcontractors tax-payer ID # or Delaware Business license #
1. EIFS	_____	_____	_____

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date *(to the Office of Management and Budget, Division of Facilities Management)*.

All the terms and conditions of *ASD District Office Renovations* have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

_____

_____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors, that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

AFFIDAVIT
OF
CONTRACTOR QUALIFICATIONS

We hereby certify that we will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term.

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, after a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

Contractor Name: _____

Contractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

END OF SECTION

SECTION 00 40 13 – BID FORM

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

For Bids Due: **April 4th, 2025** **To:** Appoquinimink School District
118 South Sixth Street
Odessa, DE 19730

Bid Package: **ASD-26A Electrical**

Name of Bidder: _____

Delaware Business License No.: _____ **Taxpayer ID No.:** _____

(Other License Nos.): _____

Phone No.: ( ) _____ - _____ **Fax No.: ( ) _____ - _____**

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

$_____
($)

ALTERNATES

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

ALTERNATE NO. 1: Deduct the lighting shown in window wall area as shown.
Add / Deduct: _____ Dollars
($) (in numbers)

ALTERNATE NO. 2: Deduct new coffee bar area.
Add / Deduct: _____ Dollars
($) (in numbers)

ALTERNATE NO. 3: New AHU as shown.
Add / Deduct:_____ Dollars
($) (in numbers)

ALTERNATE NO. 4: Tie up existing lights in 1st floor bathrooms during demo of ceilings. New ACT ceilings to be provided and lights reinstalled once demo is complete.

Add / Deduct:_____ Dollars
($) (in numbers)

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

ALLOWANCE

Include in your base bid the following FULL allowance costs, including all supervision, overhead and profit, etc. Monies not used will be credited back at end of work:

Allowance No.1: include $5,000, to be used T&M for misc work.

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids (60 days for School Districts and Department of Education), and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work as per the project schedule located in specification section 01 32 10.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

_____
(State of Corporation)

Business Address: _____
_____
_____
_____

Witness: _____ **By:** _____
(Authorized Signature)

(SEAL)

_____
(Title)

Date: _____

ATTACHMENTS

Sub-Contractor List
Non-Collusion Statement
Affidavit of Employee Drug Testing Program
Affidavit of Contractor Qualifications
Bid Security
(Others as Required by Project Manuals)

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, the following subcontractor listing must accompany any bid submittal. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the bidder will be using to perform the work and provide material for that subcontractor category. Should the bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the bidder shall list that third-tier contractor's full name and address (City & State). **If the bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the bidder intends to perform the work themselves, the bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

Subcontractor Category	Subcontractor	Address (City & State)	Subcontractors tax-payer ID # or Delaware Business license #
1. EIFS			

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

BID FORM

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date *(to the Office of Management and Budget, Division of Facilities Management)*.

All the terms and conditions of *ASD District Office Renovations* have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

_____

_____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors, that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

Appoquinimink District Office
118 South 6th Street, Odessa, DE 19730
Appoquinimink District Office Lower-Level Renovations

AFFIDAVIT
OF
CONTRACTOR QUALIFICATIONS

We hereby certify that we will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term.

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, after a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

Contractor Name: _____

Contractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

END OF SECTION

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ _____of _____ in the County of _____ _____and State of _____as **Principal**, and _____ _____ of _____ in the County of _____ and State of _____ as **Surety**, legally authorized to do business in the State of Delaware ("**State**"), are held and firmly unto the **State** in the sum of _____ _____ Dollars ($_____), or _____ percent not to exceed _____ _____ Dollars ($_____) of amount of bid on Contract No., to be paid to the **State** for the use and benefit of **Appoquinimink School District** for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bonded **Principal** who has submitted to the **Appoqinimink School District** a certain proposal to enter into this contract for the furnishing of certain material and/or services within the **State**, shall be awarded this Contract, and if said **Principal** shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the **Appoquinimink School District** this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this _____day of _____ in the year of our Lord two thousand and _____ (20___).

SEALED, AND DELIVERED IN THE
Presence of

_____
Name of Bidder (Organization)

Corporate Seal

By: _____
Authorized Signature

Attest _____

_____
Title

_____
Name of Surety

Witness:_____ By: _____

_____
Title

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 00 52 13 – STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR, CONSTRUCTION MANAGER AS ADVISER EDITION (AIA 132 – 2019; 14 PAGES)

A copy of AIA Document A132 - 2019 Edition is bound into this Project Manual following this page.

A copy of AIA Document A132 - 2019 Edition Exhibit A is bound into this Project Manual following this page.

END OF SECTION 00 52 13

DRAFT

AIA® Document A132™ – 2019

Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

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

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

«Appoquinimink School District
118 S. Sixth Street
Odessa, DE 19730
«»
«»

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

« »« »
« »
« »
« »

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

Appoquinimink School District
ASD District Office Lower-Level Renovations
118 S. Sixth Street
Odessa, DE 19730
Contract NO. TBD
«»
«»

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

The Whiting-Turner Contracting Company
131 Continental Drive – Suite 404
Newark, DE 19713
«»
«»

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

RG Architects, LLC.
200 West Main Street
Middletown, DE 19709
«»
«»

The Owner and Contractor agree as follows.

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

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

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS
EXHIBIT B DETERMINATION OF THE COST OF THE WORK

ARTICLE 1 THE CONTRACT DOCUMENTS

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

ARTICLE 2 THE WORK OF THIS CONTRACT

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

ARTICLE 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

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

[« »] The date of this Agreement.

[« »] A date set forth in a notice to proceed issued by the Owner.

[« »] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

« »

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

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

§ 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:
(Insert the date of Substantial Completion of the Work of all Contractors for the Project.)

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

« »

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

Portion of Work	Substantial Completion Date

§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:

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

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

[« »] By the following date: « »

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete

§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following:

(Check the appropriate box.)

[« »] Stipulated Sum, in accordance with Section 4.2 below

[« »] Cost of the Work plus the Contractor's Fee, in accordance with Section 4.3 below

[« »] Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

(Based on the selection above, complete Section 4.2, 4.3 or 4.4 below.)

§ 4.2 Stipulated Sum

§ 4.2.1 The Contract Sum shall be « » ($ « »), subject to additions and deductions as provided in the Contract Documents.

§ 4.2.2 Alternates

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

Item	Price

§ 4.2.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.

(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

Item	Price	Conditions for Acceptance

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

Item	Price

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

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.3 Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price
§ 4.3.1 The Cost of the Work is as defined in Exhibit B, Determination of the Cost of the Work.

§ 4.3.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

« »

§ 4.3.3 The method of adjustment of the Contractor's Fee for changes in the Work:

« »

§ 4.3.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

« »

§ 4.3.5 Rental rates for Contractor-owned equipment shall not exceed « » percent (« » %) of the standard rental rate paid at the place of the Project.

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

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.3.7 The Contractor shall prepare and submit to the Construction Manager, within 14 days of executing this Agreement, a written Control Estimate for the Owner's review and approval. The Control Estimate shall include the items in Section B.1 of Exhibit B, Determination of the Cost of the Work.

§ 4.4 Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price
§ 4.4.1 The Cost of the Work is as defined in Exhibit B, Determination of the Cost of the Work.

§ 4.4.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

« »

§ 4.4.3 The method of adjustment of the Contractor's Fee for changes in the Work:

« »

§ 4.4.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

« »

§ 4.4.5 Rental rates for Contractor-owned equipment shall not exceed « » percent (« » %) of the standard rental rate paid at the place of the Project.

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

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.4.7 Guaranteed Maximum Price
§ 4.4.7.1 The Contract Sum is guaranteed by the Contractor not to exceed « » ($ « »), subject to additions and deductions by Change Order as provided in the Contract Documents. This maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner.

§ 4.4.7.2 Alternates
§ 4.4.7.2.1 Alternates, if any, included in the Guaranteed Maximum Price:

Item	Price

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

Item	Price	Conditions for Acceptance

§ 4.4.7.3 Allowances, if any, included in the Guaranteed Maximum Price:
(Identify each allowance.)

Item	Price

§ 4.4.7.4 Assumptions, if any, upon which the Guaranteed Maximum Price is based:
(Identify each assumption.)

« »

§ 4.4.8 To the extent that the Contract Documents are anticipated to require further development, the Guaranteed Maximum Price includes the costs attributable to such further development consistent with the Contract Documents and reasonably inferable therefrom. Such further development does not include changes in scope, systems, kinds and quality of materials, finishes, or equipment, all of which, if required, shall be incorporated by Change Order.

§ 4.4.9 The Owner shall authorize preparation of revisions to the Contract Documents that incorporate the agreed-upon assumptions contained in Section 4.4.7.4. The Owner shall promptly furnish such revised Contract Documents to the Contractor. The Contractor shall notify the Owner and Architect of any inconsistencies between the agreed-upon assumptions contained in Section 4.4.7.4 and the revised Contract Documents.

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any, to be assessed in accordance with Section 3.4.)

« »

§ 4.6 Other:

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

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

« »

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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

« »

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the « » day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the « » day of the « » month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the Owner not later than « » (« ») days after the Construction Manager receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

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

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

§ 5.1.4.3 In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

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

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

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

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and

.5 Retainage withheld pursuant to Section 5.1.7.

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

§ 5.1.5 Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price

§ 5.1.5.1 With each Application for Payment, the Contractor shall submit the cost control information required in Exhibit B, Determination of the Cost of the Work, along with payrolls, petty cash accounts, receipted invoices, or invoices with check vouchers attached, and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor, plus payrolls for the period covered by the present Application for Payment, less that portion of the payments attributable to the Contractor's Fee.

§ 5.1.5.2 Applications for Payment shall show the Cost of the Work actually incurred by the Contractor through the end of the period covered by the Application for Payment and for which the Contractor has made or intends to make actual payment prior to the next Application for Payment.

§ 5.1.5.3 In accordance with AIA Document A232-2019 and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

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

.1 The Cost of the Work as described in Exhibit B, Determination of the Cost of the Work;

.2 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and

.3 The Contractor's Fee computed upon the Cost of the Work described in the preceding Section 5.1.5.3.1.1 at the rate stated in Section 4.3.2; or if the Contractor's Fee is stated as a fixed sum in Section 4.3.2 an amount which bears the same ratio to that fixed-sum Fee as the Cost of the Work included in Section 5.1.5.3.1.1 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

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

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019;

.5 The shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.5.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and

.6 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.5.4 The Owner, Construction Manager and Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 5.1.5.5 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor, and such action shall not be deemed to be a representation that (1) the Construction Manager and Architect have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Article 5 or other supporting data; (2) that the Construction Manager and Architect have made exhaustive or continuous on-site inspections; or (3) that the Construction Manager and Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

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

§ 5.1.5.7 If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232-2019.

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

§ 5.1.6 Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price

§ 5.1.6.1 With each Application for Payment, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor plus payrolls for the period covered by the present Application for Payment, less that portion of the progress payments attributable to the Contractor's Fee.

§ 5.1.6.2 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Guaranteed Maximum Price among: (1) the various portions of the Work; (2) any contingency for costs that are included in the Guaranteed Maximum Price but not otherwise allocated to another line item or included in a Change Order; and (3) the Contractor's Fee.

§ 5.1.6.2.1 The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.6.2.2 The allocation of the Guaranteed Maximum Price under this Section 5.1.6.2 shall not constitute a separate guaranteed maximum price for the Cost of the Work of each individual line item in the schedule of values.

§ 5.1.6.2.3 When the Contractor allocates costs from a contingency to another line item in the schedule of values, the Contractor shall submit supporting documentation to the Architect and Construction Manager.

§ 5.1.6.3 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed; or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Contractor on account of that portion of the Work and for which the Contractor has made payment or intends to make payment prior to the next Application for Payment by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.

§ 5.1.6.4 In accordance with AIA Document A232-2019, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

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

.1 That portion of the Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the most recent schedule of values;

.2 That portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction or, if approved in writing in advance by the Owner, suitably stored off the site at a location agreed upon in writing;

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and

.4 The Contractor's Fee, computed upon the Cost of the Work described in the preceding Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 at the rate stated in Section 4.4.2 or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work included in Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

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

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019;

.5 The shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.6.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and

.6 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.6.5 The Owner and the Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 5.1.6.6 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and such action shall not be deemed to be a representation that (1) the Construction Manager or Architect have made a detailed examination, audit, or arithmetic verification of the documentation submitted in accordance with Section 5.1.6.1 or other supporting data; (2) that the Construction Manager or Architect have made exhaustive or continuous on-site inspections; or (3) that the Construction Manager or Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits, and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

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

§ 5.1.6.8 If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232-2019.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to when the Work of this Contract is substantially complete, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

« »

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

« »

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to when the entire Work of this Contract is substantially complete, including modifications for completion of portions of the Work as provided in Section 3.4.2, insert provisions for such modifications.)

« »

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, when the Work of this Contract is substantially complete, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted when the Work of this Contract is substantially complete shall not include retainage as follows:
(Insert any other conditions for release of retainage when the Work of this Contract is substantially complete, or upon Substantial Completion of the Work of all Contractors on the Project or portions thereof.)

« »

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

§ 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

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

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232–2019, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect.

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

« »

§ 5.2.2 Final Payment Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price

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

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232–2019, and to satisfy other requirements, if any, which extend beyond final payment;

.2 the Contractor has submitted a final accounting for the Cost of the Work, pursuant to Exhibit B, Determination of the Cost of the Work and a final Application for Payment; and

.3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect in accordance with Exhibit B, Determination of the Cost of the Work.

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

« »

§ 5.3 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located. *(Insert rate of interest agreed upon, if any.)*

« » % « »

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

« »
« »
« »
« »

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A232–2019, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[« »] Arbitration pursuant to Article 15 of AIA Document A232–2019.

[« »] Litigation in a court of competent jurisdiction.

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

[« »] Other: *(Specify)*

« »

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

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.1.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

« »

§ 7.1.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019.

§ 7.2 Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price

§ 7.2.1 Termination

§ 7.2.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.2.1.2 Termination by the Owner for Cause

§ 7.2.1.2.1 If the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232–2019, the Owner shall then only pay the Contractor an amount as follows:

.1 Take the Cost of the Work incurred by the Contractor to the date of termination;

.2 Add the Contractor's Fee, computed upon the Cost of the Work to the date of termination at the rate stated in Section 4.3.2 or 4.4.2, as applicable, or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion;

.3 Subtract the aggregate of previous payments made by the Owner; and

.4 Subtract the costs and damages incurred, or to be incurred, by the Owner under Article 14 of AIA Document A232–2019.

§ 7.2.1.2.2 When the Contract Sum is based on the Cost of the Work with a Guaranteed Maximum Price, if the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232-2019, the amount, if any, to be paid to the Contractor under Article 14 of AIA Document A232-2019 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed the amount calculated in Section 7.2.1.2.1.

§ 7.2.1.2.3 The Owner shall also pay the Contractor fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Contractor that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 7.2.1.2.1.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Contractor shall, as a condition of receiving the payments referred to in this Article 7, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Contractor, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor under such subcontracts or purchase orders. All Subcontracts, purchase orders and rental agreements entered into by the Contractor will contain provisions allowing for assignment to the Owner as described above.

§ 7.2.1.3 Termination by the Owner for Convenience

If the Owner terminates the Contract for convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

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

« »

§ 7.3 Suspension

The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019; in such case, the Contract Sum and Contract Time shall be increased as provided in Article 14 of AIA Document A232–2019, except that the term "profit" shall be understood to mean the Contractor's Fee as described in Section 4.3.2 or 4.4.2, as applicable, of this Agreement.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

« »
« »
« »
« »
« »
« »

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

« »
« »
« »
« »
« »
« »

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

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A132™–2019, Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

« »

§ 8.7 Relationship of the Parties

Where the Contract is based on the Cost of the Work plus the Contractor's Fee, with or without a Guaranteed Maximum Price, the Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

the Owner to cooperate with the Architect and exercise the Contractor's skill and judgment in furthering the interests of the Owner; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the Owner's interests. The Owner agrees to furnish and approve, in a timely manner, information required by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

§ 8.8 Other provisions:

« »

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

.2 AIA Document A132™–2019, Exhibit A, Insurance and Bonds Exhibit

.3 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013 incorporated into this Agreement.)

« »

.5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages

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

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

[« »] AIA Document A132™–2019, Exhibit B, Determination of the Cost of the Work

[« »] AIA Document E235™–2019, Sustainable Projects Exhibit, Construction Manager as Adviser Edition, dated as indicated below:
(Insert the date of the E235-2019 incorporated into this Agreement.)

« »

[« »] The Sustainability Plan:

Title	Date	Pages

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

[« »] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A232–2019 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

« »

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

OWNER *(Signature)*	CONTRACTOR *(Signature)*
« »« »	« »« »
(Printed name and title)	*(Printed name and title)*

AIA Document A132™ – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:19:23 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1982814513)

DRAFT

AIA® Document A132™ – 2019 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the « » day of « » in the year « »
(In words, indicate day, month, and year.)

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

Appoquinimink School District
District Office Lower-Level Renovations
118 S. Sixth Street
Odessa, DE 19730
Contract NO. TBD
« »
« »

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

Appoquinimink School District
118 S. Sixth Street
Odessa, DE 19730
« »
« »

THE CONTRACTOR:
(Name, legal status, and address)

« »« »
« »

TABLE OF ARTICLES

A.1 GENERAL

A.2 OWNER'S INSURANCE

A.3 CONTRACTOR'S INSURANCE AND BONDS

A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A232™–2019, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section

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

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

This document is intended to be used in conjunction with AIA Document A232™–2019, General Conditions of the Contract for Construction. Article 11 of A232™–2019 contains additional insurance provisions

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

AIA Document A132™ – 2019 Exhibit A. Copyright © 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 15:18:07 ET on 07/11/2022 under Order No.3104236479 which expires on 01/31/2023, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1180854637)

A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance

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

§ A.2.3 Required Property Insurance

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

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

(Indicate below the cause of loss and any applicable sub-limit.)

Causes of Loss	Sub-Limit

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

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

Coverage	Sub-Limit

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

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

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

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of

AIA Document A132™ – 2019 Exhibit A. Copyright © 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 15:18:07 ET on 07/11/2022 under Order No.3104236479 which expires on 01/31/2023, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1180854637)

the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ A.2.4 Optional Extended Property Insurance.
The Owner shall purchase and maintain the insurance selected and described below.
(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

[« »] § A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance, to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

« »

[« »] § A.2.4.2 Ordinance or Law Insurance, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

« »

[« »] § A.2.4.3 Expediting Cost Insurance, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

« »

[« »] § A.2.4.4 Extra Expense Insurance, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

« »

[« »] § A.2.4.5 Civil Authority Insurance, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

« »

[« »] § A.2.4.6 Ingress/Egress Insurance, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

« »

[« »] § A.2.4.7 Soft Costs Insurance, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

« »

AIA Document A132™ – 2019 Exhibit A. Copyright © 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 15:18:07 ET on 07/11/2022 under Order No.3104236479 which expires on 01/31/2023, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1180854637)

§ A.2.5 Other Optional Insurance.
The Owner shall purchase and maintain the insurance selected below.
(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

[« »] § A.2.5.1 Cyber Security Insurance for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information.
(Indicate applicable limits of coverage or other conditions in the fill point below.)

« »

[« »] § A.2.5.2 Other Insurance
(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage	Limits

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS
§ A.3.1 General
§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

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

§ A.3.2 Contractor's Required Insurance Coverage
§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

« »

§ A.3.2.2 Commercial General Liability
§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than « » ($ « ») each occurrence, « » ($ « ») general aggregate, and « » ($ « ») aggregate for products-completed operations hazard, providing coverage for claims including

AIA Document A132™ – 2019 Exhibit A. Copyright © 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 15:18:07 ET on 07/11/2022 under Order No.3104236479 which expires on 01/31/2023, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1180854637)

.1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
.2 personal injury and advertising injury;
.3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;
.4 bodily injury or property damage arising out of completed operations; and
.5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

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

.1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
.2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
.3 Claims for bodily injury other than to employees of the insured.
.4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
.5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
.6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
.7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
.8 Claims related to roofing, if the Work involves roofing.
.9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
.10 Claims related to earth subsidence or movement, where the Work involves such hazards.
.11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than « » ($ « ») per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

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

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than « » ($ « ») each accident, « » ($ « ») each employee, and « » ($ « ») policy limit.

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

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

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

AIA Document A132™ – 2019 Exhibit A. Copyright © 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 15:18:07 ET on 07/11/2022 under Order No.3104236479 which expires on 01/31/2023, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1180854637)

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

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

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

§ A.3.3 Contractor's Other Insurance Coverage

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

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

« »

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

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

[« »] § A.3.3.2.1 If there is only one Contractor performing the Work on the Project, property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:

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

« »

[« »] § A.3.3.2.2 Railroad Protective Liability Insurance, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate, for Work within fifty (50) feet of railroad property.

[« »] § A.3.3.2.3 Asbestos Abatement Liability Insurance, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

[« »] § A.3.3.2.4 Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

[« »] § A.3.3.2.5 Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

AIA Document A132™ – 2019 Exhibit A. Copyright © 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 15:18:07 ET on 07/11/2022 under Order No.3104236479 which expires on 01/31/2023, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1180854637)

[« »] § A.3.3.2.6 Other Insurance

(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits

§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:

(Specify type and penal sum of bonds.)

Type	Penal Sum ($0.00)
Payment Bond	« »
Performance Bond	

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

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

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

« »

DRAFT

AIA Document A132™ – 2019 Exhibit A. Copyright © 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 15:18:07 ET on 07/11/2022 under Order No.3104236479 which expires on 01/31/2023, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1180854637)

SECTION 00 54 13

SUPPLEMENT TO AGREEMENT BETWEEN OWNER AND CONTRACTOR A132-2019

The following supplements modify the "Standard Form of Agreement Between Owner and Contractor, Construction Manager as Advisor Edition" AIA Document A132-2019. Where a portion of the Standard Form of Agreement is modified or deleted by the following, the unaltered portions of the Standard Form of Agreement shall remain in effect.

ARTICLE 3: DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

3.1 Delete paragraph 3.1 in its entirety and replace with the following:

"The date of Commencement of the Work shall be a date set forth in a notice to proceed issued by the Owner."

3.3.1 In the space provided, insert "As defined in Article 9.8 of AIA Document A232-2019 and amended by the Owner's 'Supplementary General Conditions A232-2019'"

ARTICLE 4: CONTRACT SUM

4.1 Delete paragraph 4.1 in its entirety and replace with the following:

"The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be a Stipulated Sum, in accordance with Section 4.2 below.

4.3 Delete paragraph 4.3 in its entirety.

4.4 Delete paragraph 4.4 in its entirety.

ARTICLE 5: PAYMENTS

5.1 PROGRESS PAYMENTS

5.1.3 Delete paragraph 5.1.3 in its entirety and replace with the following:

"Provided that a valid Application for Payment is received by the Architect that meets all requirements of the Contract, payment shall be made by the Owner not later than 30 days after the Owner receives the valid Application for Payment."

5.1.5 Delete paragraph 5.1.5 in its entirety.

5.1.6 Delete paragraph 5.1.6 in its entirety.

5.2.2 Delete paragraph 5.2.2 in its entirety.

5.3 Insert the interest rate of "1% per month not to exceed 12% per annum."

ARTICLE 6: DISPUTE RESOLUTION

6.2 BINDING DISPUTE RESOLUTION

Check the box “Other” – and add the following sentence:

"Any remedies available in law or in equity."

ARTICLE 7: TERMINATION or SUSPENSION

7.1.1.1 Delete paragraph 7.1.1.1 in its entirety.

7.2 Delete paragraph 7.2 in its entirety.

ARTICLE 8: MISCELLANEOUS PROVISIONS

8.4 Delete paragraph 8.4 in its entirety and replace with the following:

“The Contractor’s representative shall not be changed without ten days written notice to the Owner.”

8.7 Delete paragraph 8.7 in its entirety.

ARTICLE 9: ENUMERATION OF CONTRACT DOCUMENTS

9.1.9 Insert “Supplement to Agreement Between Owner and Contractor A132-2019”

9.1.9 Insert “Supplementary General Conditions A232-2019”

END OF SECTION

SECTION 00 54 14

SUPPLEMENT TO A132-2019 – EXHIBIT A - INSURANCE AND BONDS

The following supplements modify the "Standard Form of Agreement Between Owner and Contractor, *Construction Manager as Adviser Edition*" AIA Document A132-2019 Exhibit A Insurance and Bonds. Where a portion of the Standard Form of Agreement, Exhibit A is modified or deleted by the following, the unaltered portions of the Standard Form of Agreement, Exhibit A shall remain in effect.

ARTICLE A.2 OWNER'S INSURANCE

A.2.1 General

Delete paragraph A.2.1 in its entirety.

A.2.2 Liability Insurance

Delete paragraph A.2.2 in its entirety, except in the case of school projects this paragraph shall remain.

A.2.3 Required Property Insurance

Delete paragraph A.2.3 in its entirety.

A.2.4 Optional Extended Property Insurance

Delete paragraph A.2.4 in its entirety.

A.2.5 Other Optional Insurance

Delete paragraph A.2.5 in its entirety.

ARTICLE A.3 CONTRACTORS INSURANCE AND BONDS

A.3.1.1 Strike the last sentence of the paragraph.

A.3.1.3 Additional Insured Obligations

In the first sentence after "coverage to include (1)" delete "(1) the Owner,".

Strike the remainder of the first sentence beginning at the semicolon "; and (2) the Owner" through the end of the sentence.

Delete the second sentence in its entirety.

A.3.2.2.1 Insert "$1,000,000.00" in the blank for each occurrence.
Insert "$3,000,000.00" in the blank for general aggregate.
Insert "$3,000,000.00" in the blank for aggregate for products-completed operations hazard.

A.3.2.3 Insert "$1,000,000.00" in the blank for per accident.

A.3.2.6 Insert “$500,000.00” in the blank for each accident.
Insert “$500,000.00” in the blank for each employee.
Insert “$500,000.00” in the blank for policy limit.

A.3.2.8 Insert “$1,000,000.00” in the blank for per claim.
Insert “$3,000,000.00” in the blank for in the aggregate.

A.3.2.9 Insert “$1,000,000.00” in the blank for per claim.
Insert “$3,000,000.00” in the blank for in the aggregate.

A.3.2.10 Insert “$2,000,000.00” in the blank for per claim.
Insert “$4,000,000.00” in the blank for in the aggregate.

A.3.2.11 Strike in its entirety.

A.3.2.12 Strike in its entirety.

A.3.3.2.1 Delete paragraph 3.3.2.1 in its entirety

A.3.3.2.2 Strike in its entirety.

A.3.3.2.3 Insert “$1,000,000.00” in the blanks for per claim.
Insert “$3,000,000.00” in the blanks for in the aggregate.

A.3.4 Insert the actual contract price in both the Payment Bond and the Performance Bond Penal Sum blanks. It must be 100% of the contract price.

Strike the last sentence in this section and replace with “Payment and Performance Bonds shall be in the standard form issued by the Delaware Office of Management and Budget.”

END OF SECTION

APPOQUINIMINK SCHOOL DISTRICT

PERFORMANCE BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("**Principal**"), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety ("**Surety**"), are held and firmly bound unto the **Appoquinimink School District** in the amount of _____ ($_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole, firmly by these presents.

Sealed with our seals and dated this _____ day of _____, 20__.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as Contract No. dated the _____ day of _____, 20__ (the "Contract"), which Contract is incorporated herein by reference, shall well and truly provide and furnish all materials, appliances and tools and perform all the work required under and pursuant to the terms and conditions of the Contract and the Contract Documents (as defined in the Contract) or any changes or modifications thereto made as therein provided, shall make good and reimburse **Owner** sufficient funds to pay the costs of completing the Contract that **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, hereby stipulates and agrees, if requested to do so by **Owner**, to fully perform and complete the work to be performed under the Contract pursuant to the terms, conditions and covenants thereof, if for any cause **Principal** fails or neglects to so fully perform and complete such work.

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

Surety hereby stipulates and agrees that no modifications, omissions or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of **Surety** and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

SURETY

Name: _____

Witness or Attest: Address: _____

_____ By: _____ (SEAL)
Name: Name:
Title:

(Corporate Seal)

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

PAYMENT BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("**Principal**"), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety ("**Surety**"), are held and firmly bound unto the **Appoquinimink School District** in the amount of _____ ($_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole firmly by these presents.

Sealed with our seals and dated this _____ day of_____, 20__.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as Contract No. dated the _____ day of _____, 20__ (the "Contract"), which Contract is incorporated herein by reference, shall well and truly pay all and every person furnishing materials or performing labor or service in and about the performance of the work under the Contract, all and every sums of money due him, her, them or any of them, for all such materials, labor and service for which **Principal** is liable, shall make good and reimburse **Owner** sufficient funds to pay such costs in the completion of the Contract as **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

Surety hereby stipulates and agrees that no modifications, omission or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of **Surety** and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

SURETY

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

SECTION 00 62 76 – APPLICATION & CERTIFICATE FOR PAYMENT (AIA G732 – 2009; 1 PAGE)

A copy of AIA Document G732 - 2009 Edition is bound into this Project Manual following this page.

END OF SECTION 00 62 76

DRAFT

AIA® Document G732™ – 2009

Application and Certificate for Payment, Construction Manager as Adviser Edition

TO OWNER:	Appoquinimink School District 118 South Sixth Street Odessa, DE 19730	**PROJECT:**		**APPLICATION N(** 001	**DISTRIBUTION TO:**
					OWNER ☐
				PERIOD TO:	NSTRUCTION MANAGER ☐
					ARCHITECT ☐
FROM		**VIA CONSTRUCTIO**		**CONTRACT DAT**	CONTRACTOR ☐
CONTRACTOR:		**MANAGER:**	The Whiting-Turner Contracting Co		FIELD ☐
				PROJECT NOS: / /	☐
		VIA ARCHITECT:			
CONTRACT FO					

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703™, Continuation Sheet, is attached.

1. ORIGINAL CONTRACT SUM	$0.00
2. NET CHANGES IN THE WORK	$0.00
3. CONTRACT SUM TO DATE *(Line 1 ± 2)*	$0.00
4. TOTAL COMPLETED AND STORED TO DATE *(Column G on G703)*	$0.00
5. RETAINAGE:	
a. 0 % of Completed Work *(Column D + E on G703:* $0.00 *)=*	$0.00
b. 0 % of Stored Material *(Column F on G703:* $0.00 *)=*	$0.00
Total Retainage *(Lines 5a + 5b, or Total in Column I on G703)*	$0.00
6. TOTAL EARNED LESS RETAINAGE *(Line 4 minus Line 5 Total)*	$0.00
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT *(Line 6 from prior Certificate)*	$0.00
8. CURRENT PAYMENT DUE	$0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE *(Line 3 minus Line 6)*	$0.00

SUMMARY OF CHANGES IN THE WORK	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$0.00	$0.00
Total approved this month including Construction Change Directives	$0.00	$0.00
TOTALS	$0.00	$0.00

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:

County of:

Subscribed and sworn to before me this day of

Notary Public:

My Commission expires:

CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on evaluations of the Work and the data comprising this application, the Construction Manager and Architect certify to the Owner that to the best of their knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED $0.00

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount

CONSTRUCTION MANAGER:

By: _____ Date: _____

ARCHITECT: *(NOTE: If Multiple Prime Contractors are responsible for performing portions of the Project, the Architect's Certification is not required.)*

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any

DRAFT

AIA Document G732™– 2009 (formerly G702™CMa – 1992). Copyright ©1992 and 2009 by The American Institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This draft was produced by AIA software at 09:35:04 on 04/22/2013 under Order No. 1711530550_1 which expires on 01/01/2014, and is not for resale.
User Notes:

(1999844195)

NET CHANGES IN THE WORK	$0.00

rights of the Owner or Contractor under this Contract.

DRAFT

AIA Document G732™– 2009 (formerly G702™CMa – 1992). Copyright ©1992 and 2009 by The American Institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This draft was produced by AIA software at 09:35:04 on 04/22/2013 under Order No. 1711530550_1 which expires on 01/01/2014, and is not for resale.
User Notes:

AIA® Document G703® – 1992

Continuation Sheet

AIA Document G702®, Application and Certificate for Payment, or G732™, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached. Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED *(Not in D or E)*	TOTAL COMPLETED AND STORED TO DATE *(D+E+F)*	% *(G ÷ C)*	BALANCE TO FINISH *(C – G)*	RETAINAGE *(If variable rate)*
			FROM PREVIOUS APPLICATION *(D + E)*	THIS PERIOD					
	GRAND TOTAL								

Sample

AIA Document G703® – 1992. Copyright © 1963, 1965, 1966, 1967, 1970, 1978, 1983 and 1992 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "G703," and "AIA Contract Documents" are registered trademarks and may not be used without permission. To report copyright violations of AIA Contract Documents, e-mail copyright@aia.org.

SUBCONTRACTOR'S PARTIAL RELEASE WAIVER OF LIEN AND AFFIDAVIT

TO: THE WHITING-TURNER CONTRACTING COMPANY
(Contractor)

_____
_____
_____

RE: WT SUBCONTRACT NO.: _____
OWNER: _____
PROJECT: _____
CURRENT INVOICE NO.: _____
FOR THE PERIOD ENDING: _____

The undersigned Subcontractor, in consideration of the payments previously made and payment for the period covered by the current invoice set forth above, hereby waives and releases all mechanic's, materialman's or other liens and, to the fullest extent permitted by law, all rights to file any such liens in the future, and all claims and demands against Contractor, Owner, their sureties and the real property on which the project is located, in any manner arising out of work, labor, services, equipment or materials, performed or furnished by Subcontractor, its subcontractors, and suppliers, in connection with the Project and subcontract, through the period covered by the current invoice and all previous invoices. The release does not apply to retention, nor to extra work which Subcontractor has been authorized to proceed with by the Contractor, but for which payment has not yet been approved.

Except as noted below, Subcontractor acknowledges and represents that for the period and work covered by all previous invoices for which Subcontractor has received payment:

1. Subcontractor has paid in full all amounts for subcontracts, labor, materials and rented equipment.
2. Subcontractor has properly applied previous payments to pay all outstanding invoices related to the Project.
3. Subcontractor is aware of no claims nor any circumstances that could give rise to any future claims against Contractor, Owner, Architect or other Subcontractor on the Project.
4. All payroll, withholding, sales and other taxes, union benefits, insurance premiums and any other amount required by law, regulation or agreement to be paid in connection with labor, materials, and equipment for the Project have been paid in full.

List exceptions, if any:

Subcontractor represents that the amounts set forth below are correct and that the amount of the current payment due will be applied promptly to full payment of all outstanding amounts due from Subcontractor to others in connection with the Project.

Contract Sum to Date	$_____
Total Completed and Stored to Date	$_____
Total Retention to Date	$_____
Total Earned Less Retention	$_____
Less Previous Payments	$_____
Current Payment Due	
$_____	

I hereby certify, under penalties of perjury, that the facts, information and representations set forth above are true and accurate to the best of my knowledge, information and belief.

BY: _____
(Name of Subcontractor)

BY: _____
(Signature, Printed Name and Title), Duly Authorized Agent of Subcontractor

STATE OF)
(CITY)(COUNTY)OF))to wit:

On this _____ day of _____, _____, appeared before me _____ and he/she made oath in due form of law that the facts, information and representations set forth in the foregoing Subcontractor's Partial Release, Waiver of Lien and Affidavit, are true and accurate to the best of his/her knowledge, information and belief.

_____ My commission expires: _____
(Notary Public)

SUPPLIER'S PARTIAL RELEASE

TO: THE WHITING-TURNER CONTRACTING COMPANY *(Buyer)* DATE: ____

____

____

FROM: _____*(Supplier)*

RE: WT PURCHASE ORDER NO.: _____ DATED: _____

ITEM(S) SUPPLIED: _____

OWNER: _____

PROJECT: _____

The undersigned Supplier, in consideration of partial payment for the above referenced items, hereby waives and releases all mechanic's, materialman's or other liens and, to the fullest extent permitted by law, all rights to file any such liens in the future, and all claims and demands against Buyer, Owner, their sureties and the real property on which the project is located, in any manner arising out of the equipment or materials furnished by Supplier and covered by this payment.

Supplier represents that the amounts set forth below are correct and that this payment will promptly be applied to payment of any outstanding amounts due from Supplier to others in connection with this material or equipment.

Total Purchase Price	$_____
Less Previous Payments	$_____
Less This Payment	$_____
Remaining to be Complete	$_____

I hereby certify, under penalties of perjury, that the facts, information and representations set forth above are true and accurate to the best of my knowledge, information and belief.

_____

Supplier

BY: _____ Address: ____

Signature, Duly Authorized Agent of Supplier

____

____

Printed Name and Title

STATE OF)
(CITY)(COUNTY)OF))to wit:

On this _____ day of _____, ____, appeared before me _____ and he/she made oath in due form of law that the facts, information and representations set forth in the foregoing Supplier's Partial Release, are true and accurate to the best of his/her knowledge, information and belief.

_____

(Notary Public)

My commission expires: _____

PARTIAL WAIVER AND RELEASE
FOR SECOND TIER SUBCONTRACTORS AND SUPPLIERS

THE WHITING-TURNER CONTRACTING COMPANY *(Construction Manager)* DATE: _____

OWNER: _____

PROJECT: _____

SUBCONTRACTOR: _____

The undersigned Company, a subcontractor or supplier to the Trade Contractor named above, and hereinafter referred to as the "Company", in consideration of payments previously received and in consideration of payment for work performed through the current date set forth below, hereby waives and releases all mechanics', materialman's, or other liens and, to the fullest extent permitted by law, all rights to file any such liens in the future, and all claims and demands against the Owner, the Construction Manager and the real property on which the Project is located, and any claims arising out of work, labor, services, equipment or materials, performed or furnished by the Company, its subcontractors and suppliers, in connection with the Project, through the period covered by the current invoice.

Except as noted below, the Company further acknowledges and represents that all persons and entities which have provided labor or material, or rented equipment, for or through the Company in connection with the project have been paid in full, for the periods covered by previous payments, that previous payments to the Company have been properly applied to pay all outstanding invoices relating to the Project, that the Company is not aware of any claims, or circumstances which could give rise to future claims, against the Owner, the Construction Manager or the Project, and that all payroll, withholding and other taxes, union benefits, insurance premiums or other amounts required by law, regulation or agreement to be paid in connection with labor for the project have been paid in full through the last date of work covered by the current invoice.

List exceptions, if any:

Last date of work period covered by current Invoice: _____

_____
(Name of Company)

BY: _____ Address: _____
Signature, Duly Authorized Agent of Company

_____

_____
Printed Name and Title

STATE OF)
(CITY)(COUNTY)OF))to wit:

On this _____ day of _____, _____, appeared before me _____ and he/she made oath in due form of law that the facts, information and representations set forth in the foregoing Company's Partial Waiver and Release, are true and accurate to the best of his/her knowledge, information and belief.

_____ My commission expires: _____
Notary Public

SUBCONTRACTOR'S FINAL RELEASE AND AFFIDAVIT

TO: THE WHITING-TURNER CONTRACTING COMPANY *(Contractor)* DATE: _____

_____

_____

FROM: _____*(Subcontractor)*

RE: WT SUBCONTRACT NO.: _____ DATED: _____

OWNER: _____

PROJECT: _____

The undersigned Subcontractor, in consideration of final payment as set forth herein, hereby waives all mechanic's liens and rights to file mechanic's liens and generally releases, and agrees to indemnify and save harmless, The Whiting-Turner Contracting Company and the above Owner and their sureties, their successors and assigns, from all causes of action, suits, debts, contracts, damages, judgments, decrees, claims, bond claims, demands, liens, rights to assert liens, awards and expenses, including attorneys' fees, in law, equity or otherwise, which Subcontractor, its subcontractors and suppliers, their successors and assigns and any persons claiming through them or based upon their acts or omissions ever had, now have or hereafter may have against The Whiting-Turner Contracting Company or the above Owner, and any real property or improvements of Owner, from the beginning of the world to the date of this Release, in any manner relating to or arising in connection with the above referenced contract or project.

Subcontractor represents that the amounts set forth below are correct and that the amount of the current payment due will promptly be applied to full payment of all outstanding amounts due from Subcontractor to others in connection with the Project.

Final Contract Amount	$_____
Less Previous Payments	$_____
Final Payment Due	$_____

I hereby certify, under penalties of perjury, that the information and representations set forth above are true and accurate to the best of my knowledge, information and belief.

_____

Subcontractor

BY: _____ Address: ____

Signature, Duly Authorized Agent of Subcontractor

____

____

Printed Name and Title

STATE OF)
(CITY)(COUNTY)OF))to wit:

On this _____ day of _____, ____, appeared before me _____ and he/she made oath in due form of law that the facts, information and representations set forth in the foregoing Final Release and Affidavit, are true and accurate to the best of his/her knowledge, information and belief.

_____ My commission expires: _____

(Notary Public)

SUPPLIER'S FINAL RELEASE AND AFFIDAVIT

TO: THE WHITING-TURNER CONTRACTING COMPANY *(Buyer)* DATE: ____

____

____

FROM: _____*(Supplier)*

RE: WT PURCHASE ORDER NO.: _____ DATED: _____

ITEM(S) SUPPLIED: _____

OWNER: _____

PROJECT: _____

The undersigned Supplier, in consideration of final payment as set forth herein, hereby waives all mechanic's liens and rights to file mechanic's liens and generally releases, and agrees to indemnify and save harmless, The Whiting-Turner Contracting Company and the above Owner and their sureties, their successors and assigns, from all causes of action, suits, debts, contracts, damages, judgments, decrees, claims, bond claims, demands, liens, rights to assert liens, awards and expenses, including attorneys' fees, in law, equity or otherwise, which Supplier, its successors and assigns and any persons claiming through it, ever had, now have or hereafter may have against The Whiting-Turner Contracting Company or the above Owner, and any real property or improvements of Owner, from the beginning of the world to the date of this Release, in any manner relating to or arising in connection with the above referenced items and any others included in this Purchase.

Supplier represents that the amounts set forth below are correct and that upon receipt, this final payment will promptly be applied to full payment of all outstanding amounts due from Supplier to others in connection with the materials and/or equipment supplied to this Project.

Total Purchase Price	$_____
Less Previous Payments	$_____
Final Payment Due	$_____

I hereby certify, under penalties of perjury, that the facts, information and representations set forth above are true and accurate to the best of my knowledge, information and belief.

_____

Supplier

BY: _____ Address: ____

Signature, Duly Authorized Agent of Supplier

____

____

Printed Name and Title

STATE OF)
(CITY)(COUNTY)OF))to wit:

On this _____ day of _____, ____, appeared before me _____ and he/she made oath in due form of law that the facts, information and representations set forth in the foregoing Supplier's Final Release Affidavit, are true and accurate to the best of his/her knowledge, information and belief.

_____ My commission expires: _____

(Notary Public)

R-002
2/2001

FINAL WAIVER AND RELEASE
FOR SECOND TIER SUBCONTRACTORS AND SUPPLIERS

THE WHITING-TURNER CONTRACTING COMPANY *(Construction Manager)* DATE: _____

OWNER: _____

PROJECT: _____

SUBCONTRACTOR: _____

The undersigned Company, a subcontractor or supplier to the Subcontractor named above, and hereinafter referred to as the "Company", in consideration of payments previously received and in consideration of final payment set forth below, hereby waives and releases all mechanics', materialman's, or other liens and, to the fullest extent permitted by law, all rights to file any such liens in the future, and all claims and demands against the Owner, the Construction Manager and the real property on which the Project is located, and any claims arising out of work, labor, services, equipment or materials, performed or furnished by the Company, its subcontractors and suppliers, in connection with the Project, from the beginning of the world to the date of this Waiver and Release.

Except as noted below, the Company further acknowledges and represents that all persons and entities which have provided labor or material, or rented equipment, for or through the Company in connection with the project have been paid in full, that previous payments to the Company have been properly applied to pay all outstanding invoices relating to the project, that the Company is not aware of any claims, or circumstances which could give rise to future claims, against the Owner, the Construction Manager or the Project, and that all payroll, withholding and other taxes, union benefits, insurance premiums or other amounts required by law, regulation or agreement to be paid in connection with labor for the project have been paid in full.

Final Payment Due: $_____

_____
(Name of Company)

BY: _____ Address: _____
Signature, Duly Authorized Agent of Company

_____

_____
Printed Name and Title

STATE OF)
(CITY)(COUNTY)OF))to wit:

On this _____ day of _____, _____, appeared before me _____ and he/she made oath in due form of law that the facts, information and representations set forth in the foregoing Company's Final Waiver and Release, are true and accurate to the best of his/her knowledge, information and belief.

_____ My commission expires: _____
(Notary Public)

SECTION 00 72 013 – GENERAL CONDITIONS TO THE CONTRACT FOR CONSTRUCTION
(AIA 232 – 2019)

END OF SECTION 00 72 13

DRAFT

AIA® Document A232™ – 2019

General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

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

Appoquinimink School District
District Office Lower-Level Renovations
118 S. Sixth Street
Odessa, DE 19730
Contract NO. TBD
«»
«»

THE CONSTRUCTION MANAGER:
(Name, legal status, and address)

The Whiting-Turner Contracting Company
131 Continental Drive – Suite 404
Newark, DE 19713
« »«»
« »

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

Appoquinimink School District
118 S. Sixth Street
Odessa, DE 19730
« »«»
« »

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

RG Architects, LLC.
200 West Main Street
Middletown, DE 19709
«»«»
« »

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

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

This document is intended to be used in conjunction with AIA Documents A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

TABLE OF ARTICLES

1 GENERAL PROVISIONS

2 OWNER

3 CONTRACTOR

4 ARCHITECT AND CONSTRUCTION MANAGER

5 SUBCONTRACTORS

6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

7 CHANGES IN THE WORK

8 TIME

9 PAYMENTS AND COMPLETION

10 PROTECTION OF PERSONS AND PROPERTY

11 INSURANCE AND BONDS

12 UNCOVERING AND CORRECTION OF WORK

13 MISCELLANEOUS PROVISIONS

14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

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

§ 1.1.2 The Contract. The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and the Construction Manager or the Construction Manager's consultants, (3) between the Owner and the Architect or the Architect's consultants, (4) between the Contractor and the Construction Manager or the Construction Manager's consultants, (5) between the Owner and a Subcontractor or Sub-subcontractor (6) between the Construction Manager and the Architect, or (7) between any persons or entities other than the Owner and Contractor. The Construction Manager and Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.

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

§ 1.1.4 The Project. The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by other Contractors, and by the Owner's own forces and Separate Contractors.

§ 1.1.5 Contractors. Contractors are persons or entities, other than the Contractor or Separate Contractors, who perform Work under contracts with the Owner that are administered by the Architect and Construction Manager.

§ 1.1.6 Separate Contractors. Separate Contractors are persons or entities who perform construction under separate contracts with the Owner not administered by the Architect and Construction Manager.

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

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

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

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

§ 1.2 Correlation and Intent of the Contract Documents

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

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

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

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

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

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

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

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

§ 1.6 Notice

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

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

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

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

ARTICLE 2 OWNER

§ 2.1 General

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

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

§ 2.2 Evidence of the Owner's Financial Arrangements

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

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

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

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

§ 2.3 Information and Services Required of the Owner

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

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

§ 2.3.3 The Owner shall retain a construction manager adviser lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.4 If the employment of the Construction Manager or Architect terminates, the Owner shall employ a successor construction manager or architect to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.

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

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

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

§ 2.3.8 The Owner shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section 4.2.6.

§ 2.4 Owner's Right to Stop the Work

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

§ 2.5 Owner's Right to Carry Out the Work

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

ARTICLE 3 CONTRACTOR

§ 3.1 General

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

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

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

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

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

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.5, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction Manager and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

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

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

§ 3.3 Supervision and Construction Procedures

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

for the completed construction. The Construction Manager shall review the proposed alternative for sequencing, constructability, and coordination impacts on the other Contractors. Unless the Architect or the Construction Manager objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

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

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

§ 3.4 Labor and Materials

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

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

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

§ 3.5 Warranty

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

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

§ 3.6 Taxes

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

§ 3.7 Permits, Fees, Notices, and Compliance with Laws

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

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

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

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

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

§ 3.8 Allowances

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

§ 3.8.2 Unless otherwise provided in the Contract Documents:

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

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

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

§ 3.9 Superintendent

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

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect, through the Construction Manager, of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor, stating whether the Owner, the Construction Manager, or the Architect (1) has reasonable objection to the proposed superintendent or (2) require

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

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

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information, and the Construction Manager's use in developing the Project schedule, a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Contractors, or the construction or operations of the Owner's own forces or Separate Contractors.

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

§ 3.10.3 The Contractor shall participate with other Contractors, the Construction Manager, and the Owner in reviewing and coordinating all schedules for incorporation into the Project schedule that is prepared by the Construction Manager. The Contractor shall make revisions to the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project schedule.

§ 3.10.4 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner, Construction Manager, and Architect, and incorporated into the approved Project schedule.

§ 3.11 Documents and Samples at the Site

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

§ 3.12 Shop Drawings, Product Data, and Samples

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

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

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

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.10 through 4.2.12. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Construction Manager, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the Project submittal schedule approved by the Construction Manager and Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of other Contractors, Separate Contractors, or the Owner's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples, and similar submittals with related documents submitted by other Contractors.

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

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

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

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

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

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

information given and the design concept expressed in the Contract Documents. The Construction Manager shall review submittals for sequencing, constructability, and coordination impacts on other Contractors.

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

§ 3.13 Use of Site

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

§ 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.

§ 3.14 Cutting and Patching

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

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

§ 3.15 Cleaning Up

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

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

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

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Construction Manager, Architect, Construction Manager's and Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

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

ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

§ 4.1 General

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

§ 4.1.2 The Construction Manager is the person or entity retained by the Owner pursuant to Section 2.3.3 and identified as such in the Agreement.

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

§ 4.2 Administration of the Contract

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

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect will keep the Owner and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner and Construction Manager known deviations from the Contract Documents and defects and deficiencies observed in the Work.

§ 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner and Architect reasonably informed of the progress of the Work, and will promptly report to the Owner and Architect known deviations from the Contract Documents and the most recent Project schedule, and defects and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Contractors in accordance with the latest approved Project schedule.

§ 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. Neither the Construction Manager nor the Architect will have control over or charge of, or be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing portions of the Work.

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

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

§ 4.2.7 The Construction Manager and Architect will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9.

§ 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents, and will notify each other about the rejection. Whenever the Construction Manager considers it necessary or advisable, the Construction Manager will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, upon written authorization of the Owner, whether or not the Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.2.18 through 4.2.20 inclusive, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.2.8 nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons performing any of the Work.

§ 4.2.9 Utilizing the submittal schedule provided by the Contractor, the Construction Manager shall prepare, and revise as necessary, a Project submittal schedule incorporating information from other Contractors, the Owner, Owner's consultants, Owner's Separate Contractors and vendors, governmental agencies, and participants in the Project under the management of the Construction Manager. The Project submittal schedule and any revisions shall be submitted to the Architect for approval.

§ 4.2.10 The Construction Manager will receive and promptly review for conformance with the submittal requirements of the Contract Documents, all submittals from the Contractor such as Shop Drawings, Product Data, and Samples. Where there are other Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from the Contractor and other Contractors, and transmit to the Architect those recommended for approval. By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Construction Manager represents to the Owner and Architect that the Construction Manager has reviewed and recommended them for approval. The Construction Manager's actions will be taken in accordance with the Project submittal schedule approved by the Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect.

§ 4.2.11 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.

§ 4.2.12 Review of the Contractor's submittals by the Construction Manager and Architect is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Construction Manager and Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Construction Manager and Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

§ 4.2.13 The Construction Manager will prepare Change Orders and Construction Change Directives.

§ 4.2.14 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7, and the Architect will have authority to order minor changes in the Work as provided in Section 7.4. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.15 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples, and similar required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

§ 4.2.16 The Construction Manager will assist the Architect in conducting inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section 9.8; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

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

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

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

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

§ 4.2.21 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing, through the Construction Manager, to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

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

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

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

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

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

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

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

§ 5.3 Subcontractual Relations

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

§ 5.4 Contingent Assignment of Subcontracts

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

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction with Own Forces and to Award Other Contracts

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When the Owner performs construction or operations with the Owner's own forces or Separate Contractors, the Owner shall provide for coordination of such forces and Separate Contractors with the Work of the Contractor, who shall cooperate with them.

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

§ 6.2 Mutual Responsibility

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

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

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

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

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

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, other Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

materials and rubbish, the Owner may clean up and the Construction Manager, with notice to the Architect, will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

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

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

§ 7.2 Change Orders

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

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

§ 7.3 Construction Change Directives

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

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

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

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

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

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Construction Manager and Architect;
.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and

.5 Costs of supervision and field office personnel directly attributable to the change.

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

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

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

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

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

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

§ 7.4 Minor Changes in the Work

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

ARTICLE 8 TIME

§ 8.1 Definitions

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

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

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

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

§ 8.2 Progress and Completion

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

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

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

§ 8.3 Delays and Extensions of Time

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

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

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

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

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

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

§ 9.2 Schedule of Values

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

§ 9.3 Applications for Payment

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

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

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

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

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

§ 9.4 Certificates for Payment

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

§ 9.4.2 Where there is more than one Contractor performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives all of the Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Contractor's application with information from similar applications for progress payments from the other Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.

§ 9.4.2.1 Within seven days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Project Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Project Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.

§ 9.4.3 The Construction Manager's certification of an Application for Payment or, in the case of more than one Contractor, a Project Application and Certificate for Payment, shall be based upon the Construction Manager's evaluation of the Work and the data in the Application or Applications for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information,

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

§ 9.4.4 The Architect's issuance of a Certificate for Payment or, in the case of more than one Contractor, Project Application and Certificate for Payment, shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and data in the Application for Payment or Project Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

§ 9.4.5 The representations made pursuant to Sections 9.4.3 and 9.4.4 are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Construction Manager or Architect.

§ 9.4.6 The issuance of a Certificate for Payment or a Project Certificate for Payment will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Construction Manager or Architect may withhold a Certificate for Payment or Project Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or Architect's opinion the representations to the Owner required by Section 9.4.3 and 9.4.4 cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1 and 9.4.2. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment or a Project Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Construction Manager or Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment or Project Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's or Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from the acts and omissions described in Section 3.3.2 because of

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

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

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

§ 9.5.4 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager, and both will reflect such payment on the next Certificate for Payment.

§ 9.6 Progress Payments

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

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

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

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

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

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

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

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

§ 9.7 Failure of Payment

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

§ 9.8 Substantial Completion

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

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

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

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

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

§ 9.9 Partial Occupancy or Use

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

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

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

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon completion of the Work, the Contractor shall forward to the Construction Manager a notice that the Work is ready for final inspection and acceptance, and shall also forward to the Construction Manager a final

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

Contractor's Application for Payment. Upon receipt, the Construction Manager shall perform an inspection to confirm the completion of Work of the Contractor. The Construction Manager shall make recommendations to the Architect when the Work of all of the Contractors is ready for final inspection, and shall then forward the Contractors' notices and Application for Payment or Project Application for Payment, to the Architect, who will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final Certificate for Payment or Project Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager's and Architect's final Certificate for Payment or Project Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

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

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

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

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

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Construction Manager for review and coordination with the safety programs of other Contractors. The Construction Manager's responsibilities for review and coordination of safety programs shall not extend to direct control over or charge of the acts or omissions of the Contractors, Subcontractors, agents or employees of the

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

Contractors or Subcontractors, or any other persons performing portions of the Work and not directly employed by the Construction Manager.

§ 10.2 Safety of Persons and Property

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

.1 employees on the Work and other persons who may be affected thereby;

.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor;

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction; and

.4 construction or operations by the Owner, Separate Contractors, or other Contractors.

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

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

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

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner, Construction Manager or Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

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

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

§ 10.2.8 Injury or Damage to Person or Property

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

§ 10.3 Hazardous Materials

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

the condition, immediately stop Work in the affected area and notify the Owner, Construction Manager and Architect of the condition.

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

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

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

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

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

§ 10.4 Emergencies

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

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

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

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

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

§ 11.2 Owner's Insurance

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

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

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

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Construction Manager and Construction Manager's consultants; (3) the Architect and Architect's consultants; (4) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (5) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Construction Manager,

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

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

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

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

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

§ 11.5 Adjustment and Settlement of Insured Loss

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

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

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

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

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

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

§ 12.2.2 After Substantial Completion

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

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

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

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

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

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

§ 12.3 Acceptance of Nonconforming Work

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

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

§ 13.2 Successors and Assigns

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

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

§ 13.3 Rights and Remedies

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

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

§ 13.4 Tests and Inspections

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

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

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

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

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

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

§ 13.5 Interest

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

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

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;

.3 Because the Construction Manager has not certified or the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

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

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

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

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

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

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

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

§ 14.3 Suspension by the Owner for Convenience

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

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

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of this Contract.

§ 14.4 Termination by the Owner for Convenience

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

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

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

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

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

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

§ 15.1.2 Time Limits on Claims

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

§ 15.1.3 Notice of Claims

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

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

§ 15.1.4 Continuing Contract Performance

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

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

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

§ 15.1.6 Claims for Additional Time

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

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

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

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

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

§ 15.2 Initial Decision

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

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise,

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

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

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

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

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

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

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

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

§ 15.3 Mediation

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

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

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

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

§ 15.4 Arbitration

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

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

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

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

§ 15.4.4 Consolidation or Joinder

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

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

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

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:21:38 ET on 12/02/2021 under Order No.3482906977 which expires on 01/31/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (961244769)

SECTION 00 73 13 – SUPPLEMENTARY GENERAL CONDITIONS TO THE CONTRACT

SUPPLEMENTARY GENERAL CONDITIONS A232-2019

The following supplements modify the "General Conditions of the Contract for Construction," AIA Document A232-2019. Where a portion of the General Conditions is modified or deleted by the Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

TABLE OF ARTICLES

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

ARTICLE 1: GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

Delete the last sentence in its entirety and replace with the following:

"The Contract Documents also include Advertisement for Bid, Instructions to Bidder, sample forms, the Bid Form, the Contractor's completed Bid and the Award Letter."

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

Add the following Paragraphs:

1.2.4 In the case of an inconsistency between the Drawings and the Specifications, or within either document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Architect's interpretation.

1.2.5 The word "PROVIDE" as used in the Contract Documents shall mean "FURNISH AND INSTALL" and shall include, without limitation, all labor, materials, equipment, transportation, services and other items required to complete the Work.

1.2.6 The word "PRODUCT" as used in the Contract Documents means all materials, systems and equipment.

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

Delete Paragraph 1.5.1 in its entirety and replace with the following:

"All pre-design studies, drawings, specifications and other documents, including those in electronic form, prepared by the Architect under this Agreement are, and shall remain, the property of the Owner whether the Project for which they are made is executed or not. As for the Project for which the Architect is hired, the Architect still remain liable for any claim relating to the design that arises from the Project.

However, such documents may be used by the Owner to construct one or more like projects without the approval of, or additional compensation to, the Architect. The Contractor, Subcontractors, Sub-subcontractors and Material or Equipment Suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or Material and Equipment Supplier on other Projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and Architect's consultants.

The Architect shall not be liable for injury or damage resulting from the re-use of drawings and specifications if the Architect is not involved in the re-use Project."

1.6 NOTICE

1.6.1 Insert the following sentence at the end of the paragraph:

"Electronic mail, also known as email, is an acceptable form of electronic transmission of notices under this Agreement."

ARTICLE 2: OWNER

2.1 General

2.1.2 Delete Paragraph 2.1.2 in its entirety.

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 Delete the second sentence in this paragraph and replace with the following: "The Contractor shall have no obligation to commence the Work until the Owner issues a Purchase Order for the Project."

2.2.2 Delete the last three sentences in this paragraph.

ARTICLE 3: CONTRACTOR

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.4 Delete the third sentence in Paragraph 3.2.4.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

Add the following Paragraphs:

3.3.2.1 The Contractor shall immediately remove from the Work, whenever requested to do so by the Owner, any person who is considered by the Owner or Architect to be incompetent or disposed to be disorderly, or who for any reason is not satisfactory to the Owner, and that person shall not again be employed on the Work without the consent of the Owner or the Architect.

3.3.4 The Contractor must provide suitable storage facilities at the Site, or an alternative site as approved by the Owner, for the proper protection and safe storage of their materials. Consult the Owner and the Architect before storing any materials.

3.3.5 When any room is used as a shop, storeroom, office, etc., by the Contractor or Subcontractor(s) during the construction of the Work, the Contractor making use of these areas will be held responsible for any repairs, patching or cleaning arising from such use.

3.4 LABOR AND MATERIALS

3.4.1.1 Add a new section 3.4.1.1:

"The Contractor, at their expense shall bear the costs to accurately identify the location of all underground utilities in the area of their excavation and shall bear all cost for any repairs required, out of failure to accurately identify said utilities."

Add the Following Paragraphs:

3.4.4 Before starting the Work, each Contractor shall carefully examine all preparatory Work that has been executed to receive their Work. Check carefully, by whatever means are required, to insure that its Work and adjacent, related Work, will finish to proper contours, planes and levels. Promptly notify the General Contractor/Construction Manager of any defects or imperfections in preparatory Work which will in any way affect satisfactory completion of its Work. Absence of such notification will be construed as an acceptance of preparatory Work and later claims of defects will not be recognized.

3.4.5 Under no circumstances shall the Contractor's Work proceed prior to preparatory Work having been completely cured, dried and/or otherwise made satisfactory to receive this Work. Responsibility for timely installation of all materials rests solely with the Contractor responsible for that Work, who shall maintain coordination at all times.

3.5 WARRANTY

Add the following Paragraphs:

3.5.3 The Contractor will warrant all materials and workmanship against original defects, except injury from proper and usual wear when used for the purpose intended, for two years after Substantial Completion of the project in accordance with Section 9.8.4 of this Agreement, and will maintain all items in condition that conforms with the Contract Documents during the period of warranty.

3.5.4 Non-conforming work during the period of warranty will be corrected by the Contractor at its expense upon demand of the Owner, it being required that the Work conforms to the Contract Documents at the expiration of the warranty period.

3.5.5 In addition to the General Warranty there are other warranties required for certain items for different periods of time than the two years as above and are particularly so stated in that part of the specifications referring to same. The said warranties will commence at the same time as the General Warranty.

3.5.6 If the Contractor fails to remedy any failure, defect or damage within a reasonable time after receipt of notice, the Owner will have the right to replace, repair, or otherwise remedy the failure, defect or damage at the Contractor's expense.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

Add the following Paragraphs:

3.11.1 During the course of the Work, the Contractor shall maintain a record set of drawings on which the Contractor shall mark the actual physical location of all piping, valves, equipment, conduit, outlets, access panels, controls, actuators, including all appurtenances that will be concealed once construction is complete, etc., including all invert elevations.

3.11.2 At the completion of the project, the Contractor shall obtain a set of reproducible drawings from the Architect, and neatly transfer all information outlined in 3.11.1 to provide a complete record of the as-built conditions.

3.11.3 The Contractor shall provide two (2) prints of the as-built conditions, along with the reproducible drawings themselves, to the Owner and one (1) set to the Architect. In addition, attach one complete set to each of the Operating and Maintenance Instructions/Manuals.

3.15 CLEANING UP

3.15.2 Strike sentence in its entirety and replace with the following:

"If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall withhold the amount that reflects the cost of the cleanup from any moneys owed the Contractor. If the cost of cleanup exceeds the moneys owed to the Contractor, the Owner shall be entitled to reimbursement from the Contractor for the amount exceeding what is withheld.

3.17 In the second sentence of 3.17, insert "indemnify and" between "shall" and "hold".

ARTICLE 4: ARCHITECT AND CONSTRUCTION MANAGER

4.2 Administration of the Contract

Delete the first sentence of Paragraph 4.2.11 and replace with the following:

The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples for the purpose of checking for conformance with the Contract Documents.

Delete the second sentence of Paragraph 4.2.11 and replace with the following:

The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work in the activities of the Owner, Contractor or separate Contractors, while allowing sufficient time in the Owner's professional judgment to permit adequate review.

Add the following to Paragraph 4.2.17:

There will be no full-time Project representative provided by the Owner or Architect on site for this Project.

Add to Paragraph 4.2.20 "and in compliance with all applicable codes, regulations and ordinances." to the end of the sentence.

ARTICLE 5: SUBCONTRACTORS

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

Delete Paragraph 5.2.3 in its entirety and replace with the following:

5.2.3 If the Owner, Architect or Construction Manager has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Architect or Construction Manager has no reasonable objection, subject to the statutory requirements of 29 Delaware Code § 6962(d)(10)b.3 and 4.

ARTICLE 6: CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

6.1.1 Delete "and waiver of subrogation" from the last sentence.

6.1.3 Delete Paragraph 6.1.3 in its entirety and replace with the following:

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

6.2 MUTUAL RESPONSIBILITY

6.2.3 In the second sentence, strike the word "shall" and insert the word "may".

ARTICLE 7: CHANGES IN THE WORK

(SEE ARTICLE 7: CHANGES IN WORK IN THE GENERAL REQUIREMENTS)

ARTICLE 8: TIME

8.2 PROGRESS AND COMPLETION

Add the following Paragraphs:

8.2.1.1 Refer to Specification Section SUMMARY OF WORK for Contract time requirements.

8.2.4 If the Work falls behind the Progress Schedule as submitted by the Contractor, the Contractor shall employ additional labor and/or equipment necessary to bring the Work into compliance with the Progress Schedule at no additional cost to the Owner.

8.3 DELAYS AND EXTENSION OF TIME

8.3.1 Strike "binding dispute resolution" and insert "remedies at law or in equity".

Add the following Paragraph:

8.3.2.1 The Contractor shall update the status of the suspension, delay, or interruption of the Work with each Application for Payment. (The Contractor shall report the termination of such cause immediately upon the termination thereof.) Failure to comply with this procedure shall constitute a waiver for any claim for adjustment of time or price based upon said cause.

Delete Paragraph 8.3.3 in its entirety and replace with the following:

8.3.3 Except in the case of a suspension of the Work directed by the Owner, an extension of time under the provisions of Paragraph 8.3.1 shall be the Contractor's sole remedy in the progress of the Work and there shall be no payment or compensation to the Contractor for any expense or damage resulting from the delay.

Add the following Paragraph:

8.3.4 By permitting the Contractor to work after the expired time for completion of the project, the Owner does not waive its rights under the Contract.

8.3.5 The parties agree that Paragraph 8.3.3 of the Supplementary General Conditions does not apply to the Construction Manager in the event of a delay caused by a party other than the Construction Manager.

ARTICLE 9: PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

9.1.2 Strike Section 9.1.2 in its entirety.

9.2 SCHEDULE OF VALUES

Add the following Paragraphs:

9.2.1 The Schedule of Values shall be submitted using AIA Document G732, Continuation Sheet to G703.

9.3 APPLICATIONS FOR PAYMENT

Add the following Paragraph:

9.3.1.3 Application for Payment shall be submitted on AIA Document G732 “Application and Certificate for Payment”, supported by AIA Document G703 “Continuation Sheet”. Said Applications shall be fully executed and notarized.

Add the following Paragraphs:

9.3.4 Until Closeout Documents have been received and outstanding items completed the Owner will pay 95% (ninety-five percent) of the amount due the Contractor on account of progress payments.

9.3.5 The Contractor shall provide a current and updated Progress Schedule to the Architect with each Application for Payment. Failure to provide Schedule will be just cause for rejection of Application for Payment.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Add the following to 9.5.1:

.8 failure to provide a current Progress Schedule;
.9 a lien or attachment is filed;
.10 failure to comply with mandatory requirements for maintaining Record Documents.

9.6 PROGRESS PAYMENTS

Delete Paragraph 9.6.1 in its entirety and replace with the following:

9.6.1 After the Architect and the Construction Manager have approved and issued a Certificate for Payment, payment shall be made by the Owner within 30 days after Owner’s receipt of the Certificate for Payment.

9.6.8 Strike "Provided the Owner has fulfilled its payment obligations under the Contract Documents, the" and replace with "The".

9.7 FAILURE OF PAYMENT

In first sentence, strike the first reference to "seven" and insert "thirty (30)". Also strike "binding dispute resolution" and insert "remedies at law or in equity".

9.8 SUBSTANTIAL COMPLETION

9.8.5 In the second sentence, strike "shall" and insert "may".

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following Paragraphs:

10.1.1 Each Contractor shall develop a safety program in accordance with the Occupational Safety and Health Act of 1970. A copy of said plan shall be furnished to the Owner and Architect prior to the commencement of that Contractor's Work.

10.1.2 Each Contractor shall appoint a Safety Representative. Safety Representatives shall be someone who is on site on a full-time basis. If deemed necessary by the Owner or Architect, Contractor Safety meetings will be scheduled. The attendance of all Safety Representatives will be required. Minutes will be recorded of said meetings by the Contractor and will be distributed to all parties as well as posted in all job offices/trailers etc.

10.2 SAFETY OF PERSONS AND PROPERTY

Add the following Paragraph:

10.2.4.1 As required in the Hazardous Chemical Act of June 1984, all vendors supplying any material that may be defined as hazardous must provide Material Safety Data Sheets for those products. Any chemical product should be considered hazardous if it has a caution warning on the label relating to a potential physical or health hazard, if it is known to be present in the workplace, and if employees may be exposed under normal conditions or in foreseeable emergency situations. Material Safety Data Sheets shall be provided directly to the Owner or its designee, along with the shipping slips that include those products.

10.3 HAZARDOUS MATERIALS

Delete Paragraph 10.3.3 in its entirety.

Delete Paragraphs 10.3.6 in its entirety.

ARTICLE 11: INSURANCE AND BONDS

11.1 CONTRACTOR'S INSURANCE AND BONDS

11.1.1 Strike "Owner," at the beginning of the third sentence.

11.1.2 Add the following sentence at the end of the paragraph: "The bonds will conform to those forms approved by the Office of Management and Budget."

11.2 OWNER'S INSURANCE

Delete Paragraph 11.2 in its entirety and replace with the following:

11.2 The Owner will not provide Builder's All Risk Insurance for the Project. The Construction Manager will provide Builder's All Risk Insurance for the Project. The Contractor and all Subcontractors shall provide coverage for materials, fixtures and/or equipment being used in the construction or renovation of a building or structure should those items sustain physical loss or damage from a covered cause.

11.3 WAIVERS OF SUBROGATION

Delete Paragraph 11.3 and its subparagraphs in their entirety. Substitute the following:
The Construction Manager and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, consultants and employees, each of the other; (2) the Architect and Architect's consultants; (3) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (4) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this Article shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property. For clarity, the Owner does not waive any of its subrogation rights.

11.4 LOSS OF USE, BUSINESS INTERRUPTION, AND DELAY IN COMPLETION INSURANCE

Delete Paragraph 11.4 in its entirety.

11.5 ADJUSTMENT AND SETTLEMENT OF INSURED LOSS
Delete Paragraph 11.5 in its entirety. Substitute the following:
A loss insured under the property insurance required by the Agreement shall be adjusted by the Construction Manager and made payable to the Construction Manager. The Construction Manager shall pay the Architect and Contractor their just shares of insurance proceeds received by the Construction Manager, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner. Prior to settlement of an insured loss, the Construction Manager shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Construction Manager shall settle the loss and the Contractor shall be bound by the settlement and allocation. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Construction Manager may proceed to settle the insured loss, and any dispute between the Construction Manager and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant remedies at law and in equity. For clarity, the Owner shall be listed as an Additional Insured to protect the Owner's property interest on the Project under the Builder's Risk Insurance.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.2.2 AFTER SUBSTANTIAL COMPLETION

12.2.2.1 In the first sentence, strike “within one year after the date of Substantial Completion of the Work or designated portion thereof” and replace with “within two years after the date of Substantial Completion of the Project in accordance with Section 9.8.4 of this Agreement or designated portion thereof”.

12.2.2.1 In the third sentence of the paragraph, strike “one year period” and replace it with “two year period”.

Add the following Paragraph:

12.2.2.1.1 At any time during the progress of the Work, or in any case where the nature of the defects will be such that it is not expedient to have corrected, the Owner, at its option, will have the right to deduct such sum, or sums, of money from the amount of the Contract as it considers justified to adjust the difference in value between the defective work and that required under contract including any damage to the structure.

12.2.2.2 Strike “one” and insert “two”.

12.2.2.3 Strike “one” and insert “two”.

12.2.5 In second sentence, strike “one” and insert “two”.

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

13.1 Strike the second sentence in its entirety.

13.5 INTEREST

13.5 Strike 13.5 in its entirety and replace with the following:
"Payments are due 30 days after receipt of a valid Application for Payment. After that 30 day period, interest may be charged at the rate of 1% per month not to exceed 12% per annum."

Add the following Paragraph:

13.6 CONFLICTS WITH FEDERAL STATUTES OR REGULATIONS

13.6.1 If any provision, specifications or requirement of the Contract Documents conflict or is inconsistent with any statute, law or regulation of the government of the United State of America, the Contractor shall notify the Architect and Owner immediately upon discovery.

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

Delete Paragraph 14.4.3 in its entirety and replace with the following:

14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and cost incurred by reason of such termination along with reasonable overhead.

ARTICLE 15: CLAIMS AND DISPUTES

15.1.2 TIME LIMITS ON CLAIMS.

15.1.2 Strike "in accordance with the requirements of the binding dispute resolution method selected in the Agreement and" from the first sentence.
Strike the second sentence in its entirety.

15.1.4 CONTINUING CONTRACT PERFORMANCE

15.1.4.2 Strike in its entirety.

15.1.7 CLAIMS FOR CONSEQUENTIAL DAMAGES

Delete Paragraph 15.1.7 and its subparagraphs in their entirety.

15.2 INITIAL DECISION

15.2.1 Delete "and binding dispute resolution"

15.2.5 Delete in its entirety and replace with the following:

15.2.5 The Architect will approve or reject Claims by written decision, which shall state the reasons therefore and shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Architect shall be subject to mediation and other remedies at law or in equity.

Delete Paragraph 15.2.6 and its subparagraphs in their entirety.

15.3 MEDIATION

15.3.1 Strike "binding dispute resolution" and insert "any or all remedies at law or in equity".

15.3.2 In the first sentence, delete "administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedure in effect on the date of the Agreement,". Also strike "binding dispute resolution" and insert "remedies at law and in equity".

15.3.3 Strike in its entirety.

END OF SUPPLEMENTARY GENERAL CONDITIONS TO THE CONTRACT

SECTION 00 73 46

WAGE DETERMINATION SCHEDULE

See Continuation Sheet Attached Document.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF CONSTRUCTION ENFORCEMENT
CHAPMAN BLDG., STE. 210
252 CHAPMAN RD.
NEWARK, DE. 19702

Via Electronic and Regular Mail

October 16, 2024

Jack Renaud
R G Architects, LLC
200 West Main
Middletown, DE 19709

Re: 22017 Appoquinimink School District Office Renovations, New Castle County, DE

Dear Mr. Renaud:

I am responding to your request for a category determination for the 22017 Appoquinimink School District Office Renovations, which is a state funded construction project located in New Castle County, DE. The work consists of demolishing existing interior partitions office walls and renovate the space to be an open office concept. New interior finishes, ceilings, lighting and diffusers. Additional work consists of enclosing exterior terrace spaces to be interior offices. Existing systems will extend to service new spaces. New interior furniture will be provided by owner. You estimate the total cost of construction for this project to be $900,000.00.

Based upon the information you provided the Department of Labor has determined that this project is a Building Construction project.

Delaware's Prevailing Wage Regulations provide that the rates applicable to a project are the rates in effect on the date of publication of the specifications for that project. I have enclosed a certified copy of the prevailing wage rates effective March 15, 2024, which were amended June 14, 2024 for Building Construction to be included in your bid specification. However, please be advised that, in the event that a contract for a project is not executed within one hundred and twenty (120) days from the earliest date the specifications were published, the rates in effect at the time of the execution of the contract shall be the applicable rates for the project.

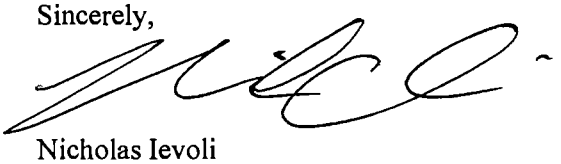
This determination is directed solely to the parties identified herein. It is based on the unique facts relevant to this matter. It does not constitute precedent and should not be cited as such by future parties.

Pursuant to 19 Del. Chapter 36, all contractors must obtain their Contractor Registration Certificate prior to performing construction services or maintenance work throughout Delaware. Contractors can submit an application by visiting the Delaware One Stop https://onestop.delaware.gov/Operate_Contractors.

Lastly, please see the enclosed debarment list. Entities/individuals listed shall not be permitted to bid on, be awarded or work on Delaware State funded construction projects, in the timeframe specified, as provided for under 29 Del.C.6960 or other applicable State statutes.

If you have any questions or I can provide any additional assistance, please do not hesitate to contact me at (302) 451-3458.

Sincerely,



Nicholas Ievoli
Labor Law Enforcement Officer II
Nicholas.Ievoli@delaware.gov

Enclosures

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS OFFICE
CONSTRUCTION INDUSTRY ENFORCEMENT
PHONE: (302) 318-2769

Mailing Address:
252 Chapman Road
Suite 210
Newark, DE 19702

Located at:
252 Chapman Road
Suite 210
Newark, DE 19702

PREVAILING WAGES FOR BUILDING CONSTRUCTION
EFFECTIVE MARCH 15, 2024 – AMENDED JUNE 14, 2024

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	29.03	35.74	52.03
BOILERMAKERS	86.90	44.09	64.81
BRICKLAYERS	65.24	65.24	65.24
CARPENTERS	61.06	61.06	49.30
CEMENT FINISHERS	91.66	65.19	50.55
ELECTRICAL LINE WORKERS	57.72	49.50	37.74
ELECTRICIANS	81.62	81.62	81.62
ELEVATOR CONSTRUCTORS	113.66	81.88	103.45
GLAZIERS	83.30	83.30	71.92
INSULATORS	67.20	67.20	67.20
IRON WORKERS	75.32	75.32	75.32
LABORERS	55.65	55.65	55.65
MILLWRIGHTS	85.36	85.36	68.57
PAINTERS	57.60	57.60	57.60
PILEDRIVERS	88.62	49.97	40.41
PLASTERERS	37.89	37.89	28.08
PLUMBERS/PIPEFITTERS/STEAMFITTERS	77.30	80.57	71.11
POWER EQUIPMENT OPERATORS	81.29	81.29	81.29
ROOFERS-COMPOSITION	29.45	29.41	31.82
ROOFERS-SHINGLE/SLATE/TILE	23.34	27.77	21.83
SHEET METAL WORKERS	84.53	84.53	84.53
SOFT FLOOR LAYERS	60.12	60.12	60.12
SPRINKLER FITTERS	70.52	70.52	70.52
TERRAZZO/MARBLE/TILE FNRS	70.79	70.79	79.54
TERRAZZO/MARBLE/TILE STRS	78.73	78.73	88.22
TRUCK DRIVERS	55.25	34.83	27.11

CERTIFIED: 10-16-2024

BY: Salina Crandall /As Proxy Acting

ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

NOTE: THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

CLASSIFICATIONS OF WORKERS ARE DETERMINED BY THE DEPARTMENT OF LABOR. FOR ASSISTANCE IN CLASSIFYING WORKERS, OR FOR A COPY OF THE REGULATIONS OR CLASSIFICATIONS, PHONE (302) 318-2769.

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

PROJECT: 22017 Appoquinimink School District Office Renovations, New Castle County

PREVAILING WAGE DEBARMENT LIST

The following contractors have been debarred for violations of the prevailing wage law 29Del.C. §6960 or other applicable State statutes.

Therefore, no public construction contract in this State shall be bid on, awarded to, or received by contractors and individuals on this list for a period of (3) three years from the date of the judgment or as deemed by a court of competent jurisdiction.

Contractor	Address	Date of Debarment
Mullen Brothers, Inc. and Daniel Mullen, individually	3375 Garnett Road, Boothwyn, PA 19060	Indefinite/ Civil Contempt
State Contractors Corporation, and Jose Oscar Rivera, individually	13004 Hathaway Drive Silver Spring, MD 20906	Indefinite/ 19 Del.C. 2374(f)
Green Granite and Jason Green, individually	604 Heatherbrooke Court Avondale, PA 19311	Indefinite/ Civil Contempt
Pro Image Landscaping, Inc. and Owner(s) individually	23 Commerce Street Wilmington, DE 19801 and/or 2 Cameo Road Claymont, DE 19703	Indefinite/19 Del.C. §108 & 10 Del.C. 542(c)
Liberty Mechanical, LLC and Owner(s), individually	2032 Duncan Road Wilmington, DE 19801	Indefinite/ 19 Del.C. 2374(f)
Integrated Mechanical and Fire Systems Inc. and Allison Sheldon, individually	4601 Governor Printz Boulevard Wilmington, DE 19809	Indefinite/19 Del.C. §108 & 10 Del.C. 542(c)
ACH 1, INC.	873 Salem Church Road Newark, DE 19702	Indefinite/19 Del.C.6960

Updated: July 6, 2022

SECTION 00 81 13

GENERAL REQUIREMENTS

TABLE OF ARTICLES

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

ARTICLE 1: GENERAL

1.1 CONTRACT DOCUMENTS

1.1.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary and what is required by one shall be as binding as if required by all. Performance by the Contractor shall be required to an extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results.

1.1.2 Work including material purchases shall not begin until the Contractor is in receipt of a bonafide State of Delaware Purchase Order. Any work performed or material purchases prior to the issuance of the Purchase Order is done at the Contractor's own risk and cost.

1.2 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

1.2.1 For Public Works Projects financed in whole or in part by state appropriation the Contractor agrees that during the performance of this contract:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, sex, color, sexual orientation, gender identity or national origin. The Contractor will take positive steps to ensure that applicants are employed and that employees are treated during employment without regard to their race, creed, sex, color, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, sex, color, sexual orientation, gender identity or national origin."

ARTICLE 2: OWNER

(NO ADDITIONAL GENERAL REQUIREMENTS – SEE SUPPLEMENTARY GENERAL CONDITIONS)

ARTICLE 3: CONTRACTOR

3.1 Schedule of Values: The successful Bidder shall within twenty (20) days after receiving notice to proceed with the work, furnish to the Owner a complete schedule of values on the various items comprising the work.

3.2 Subcontracts: Upon approval of Subcontractors, the Contractor shall award their Subcontracts as soon as possible after the signing of their own contract and see that all material, their own and those of their Subcontractors, are promptly ordered so that the work will not be delayed by failure of materials to arrive on time.

3.3 Before commencing any work or construction, the General Contractor is to consult with the Owner as to matters in connection with access to the site and the allocation of Ground Areas for the various features of hauling, storage, etc.

3.4 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions.

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

3.6 The Contractor warrants to the Owner that materials and equipment furnished will be new and of good quality, unless otherwise permitted, and that the work will be free from defects and in conformance with the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved, may be considered defective. If required by the Owner, the Contractor shall furnish evidence as to the kind and quality of materials and equipment provided.

3.7 Unless otherwise provided, the Contractor shall pay all sales, consumer, use and other similar taxes, and shall secure and pay for required permits, fees, licenses, and inspections necessary for proper execution of the Work.

3.8 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on performance of the Work. The Contractor shall promptly notify the Owner if the Drawings and Specifications are observed to be at variance therewith.

3.9 The Contractor shall be responsible to the Owner for the acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons performing portions of the Work under contract with the Contractor.

3.10 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from and about the Project all waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials. The Contractor shall be responsible for returning all damaged areas to their original conditions.

3.11 STATE LICENSE AND TAX REQUIREMENTS

3.11.1 Each Contractor and Subcontractor shall be licensed to do business in the State of Delaware and shall pay all fees and taxes due under State laws. In conformance with Section 2503, Chapter 25, Title 30, Delaware Code, "the Contractor shall furnish the Delaware Department of Finance within ten (10) days after entering into any contract with a contractor or subcontractor not a resident of this State, a statement of total value of such contract or contracts together with the names and addresses of the contracting parties."

3.12 The Contractor shall comply with all requirements set forth in Section 6962, Chapter 69, Title 29 of the Delaware Code.

3.13 During the contract Work, the Contractor and each Subcontractor, shall implement an Employee Drug Testing Program in accordance with OMB Regulation 4104 - "Regulations for the Drug Testing of Contractor and Subcontractor Employees Working

on “Large Public Works Projects”. “Large Public Works” is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.1 CONTRACT SURETY

4.1.1 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

4.1.2 All bonds will be required as follows unless specifically waived elsewhere in the Bidding Documents.

4.1.3 Contents of Performance Bonds – The bond shall be in the form approved by the Office of Management and Budget. The bond shall be conditioned upon the faithful compliance and performance by the successful bidder of each and every term and condition of the contract and the proposal, plans, specifications, and bid documents thereof. Each term and condition shall be met at the time and in the manner prescribed by the Contract, Bid documents and the specifications, including the payment in full to every person furnishing materiel or performing labor in the performance of the Contract, of all sums of money due the person for such labor and materiel. (The bond shall also contain the successful bidder’s guarantee to indemnify and save harmless the State and the agency from all costs, damages and expenses growing out of or by reason of the Contract in accordance with the Contract.)

4.1.4 Invoking a Performance Bond – The agency may, when it considers that the interest of the State so requires, cause judgement to be confessed upon the bond.

4.1.5 Within twenty (20) days after the date of notice of award of contract, the Bidder to whom the award is made shall furnish a Performance Bond and Labor and Material Payment Bond, each equal to the full amount of the Contract price to guarantee the faithful performance of all terms, covenants and conditions of the same. The bonds are to be issued by an acceptable Bonding Company licensed to do business in the State of Delaware and shall be issued in duplicate.

4.1.6 Performance and Payment Bonds shall be maintained in full force (warranty bond) for a period of two (2) years after the date of the Certificate for Final Payment. The Performance Bond shall guarantee the satisfactory completion of the Project and that the Contractor will make good any faults or defects in his work which may develop during the period of said guarantees as a result of improper or defective workmanship, material or apparatus, whether furnished by themselves or their Sub-Contractors. The Payment Bond shall guarantee that the Contractor shall pay in full all persons, firms or corporations who furnish labor or material or both labor and material for, or on account of, the work included herein. The bonds shall be paid for by this Contractor. The Owner shall have the right to demand that the proof parties signing the bonds are duly authorized to do so.

4.2 FAILURE TO COMPLY WITH CONTRACT

4.2.1 If any firm entering into a contract with the State, or Agency that neglects or refuses to perform or fails to comply with the terms thereof, the Agency which signed the Contract may terminate the Contract and proceed to award a new contract in accordance with this Chapter 69, Title 29 of the Delaware Code or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond. Nothing herein shall preclude the Agency from pursing additional remedies as otherwise provided by law.

4.3 CONTRACT INSURANCE AND CONTRACT LIABILITY

4.3.1 In addition to the bond requirements stated in the Bid Documents, each successful Bidder shall purchase adequate insurance for the performance of the Contract and, by submission of a Bid, agrees to indemnify and save harmless and to defend all legal or equitable actions brought against the State, any Agency, officer and/or employee of the State, for and from all claims of liability which is or may be the result of the successful Bidder's actions during the performance of the Contract.

4.3.2 The purchase or nonpurchase of such insurance or the involvement of the successful Bidder in any legal or equitable defense of any action brought against the successful Bidder based upon work performed pursuant to the Contract will not waive any defense which the State, its agencies and their respective officers, employees and agents might otherwise have against such claims, specifically including the defense of sovereign immunity, where applicable, and by the terms of this section, the State and all agencies, officers and employees thereof shall not be financially responsible for the consequences of work performed, pursuant to said contract.

4.4 RIGHT TO AUDIT RECORDS

4.4.1 The Owner shall have the right to audit the books and records of a Contractor or any Subcontractor under any Contract or Subcontract to the extent that the books and records relate to the performance of the Contract or Subcontract.

4.4.2 Said books and records shall be maintained by the Contractor for a period of seven (7) years from the date of final payment under the Prime Contract and by the Subcontractor for a period of seven (7) years from the date of final payment under the Subcontract.

ARTICLE 5: SUBCONTRACTORS

5.1 SUBCONTRACTING REQUIREMENTS

5.1.1 All contracts for the construction, reconstruction, alteration or repair of any public building (not a road, street or highway) shall be subject to the following provisions:

1. A contract shall be awarded only to a Bidder whose Bid is accompanied by a statement containing, for each Subcontractor category, the name and address (city or town and State only – street number and P.O. Box addresses not required) of the subcontractor whose services the Bidder intends to use in performing the Work and providing the material for such Subcontractor category.

2. A Bid will not be accepted nor will an award of any Contract be made to any Bidder which, as the Prime Contractor, has listed itself as the Subcontractor for any Subcontractor unless:

   A. It has been established to the satisfaction of the awarding Agency that the Bidder has customarily performed the specialty work of such Subcontractor category by artisans regularly employed by the Bidder's firm;

   B. That the Bidder is duly licensed by the State to engage in such specialty work, if the State requires licenses; and

C. That the Bidder is recognized in the industry as a bona fide Subcontractor or Contractor in such specialty work and Subcontractor category.

5.1.2 The decision of the awarding Agency as to whether a Bidder who list itself as the Subcontractor for a Subcontractor category shall be final and binding upon all Bidders, and no action of any nature shall lie against any awarding agency or its employees or officers because of its decision in this regard.

5.1.3 After such a Contract has been awarded, the successful Bidder shall not substitute another Subcontractor for any Subcontractor whose name was set forth in the statement which accompanied the Bid without the written consent of the awarding Agency.

5.1.4 No Agency shall consent to any substitution of Subcontractors unless the Agency is satisfied that the Subcontractor whose name is on the Bidders accompanying statement:

A. Is unqualified to perform the work required;

B. Has failed to execute a timely reasonable Subcontract;

C. Has defaulted in the performance on the portion of the work covered by the Subcontract; or

D. Is no longer engaged in such business.

5.1.5 Should a Bidder be awarded a contract, such successful Bidder shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

5.1.6 The Contractor may employ additional Subcontractors on the jobsite only after submitting a copy of the Subcontractor's Employee Drug Testing Program to the Owner for approval. A Contractor or Subcontractor shall not commence work until the Owner has concluded its review and determined that the submitted Employee Drug Testing Program complies with OMB Regulation 4104.

5.2 PENALTY FOR SUBSTITUTION OF SUBCONTRACTORS

5.2.1 Should the Contractor fail to utilize any or all of the Subcontractors in the Contractor's Bid statement in the performance of the Work on the public bidding, the Contractor shall be penalized in the amount of (project specific amount*). The Agency may determine to deduct payments of the penalty from the Contractor or have the amount paid directly to the Agency. Any penalty amount assessed against the Contractor may be remitted or refunded, in whole or in part, by the Agency awarding the Contract, only if it is established to the satisfaction of the Agency that the Subcontractor in question has defaulted or is no longer engaged in such business. No claim for the remission or refund of any penalty shall be granted unless an application is filed within one year after the liability of the successful Bidder accrues. All

penalty amounts assessed and not refunded or remitted to the contractor shall be reverted to the State.

*one (1) percent of contract amount not to exceed $10,000

5.3 ASBESTOS ABATEMENT

5.3.1 The selection of any Contractor to perform asbestos abatement for State-funded projects shall be approved by the Office of Management and Budget, Division of Facilities Management pursuant to Chapter 78 of Title 16.

5.4 STANDARDS OF CONSTRUCTION FOR THE PROTECTION OF THE PHYSICALLY HANDICAPPED

5.4.1 All Contracts shall conform with the standard established by the Delaware Architectural Accessibility Board unless otherwise exempted by the Board.

5.5 CONTRACT PERFORMANCE

5.5.1 Any firm entering into a Public Works Contract that neglects or refuses to perform or fails to comply with its terms, the Agency may terminate the Contract and proceed to award a new Contract or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond.

ARTICLE 6: CONSTRUCTION BY OWNER OR SEPARATE CONTRACTORS

6.1 The Owner reserves the right to simultaneously perform other construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other Projects at the same site.

6.2 The Contractor shall afford the Owner and other Contractors reasonable opportunity for access and storage of materials and equipment, and for the performance of their activities, and shall connect and coordinate their activities with other forces as required by the Contract Documents.

ARTICLE 7: CHANGES IN THE WORK

7.1 The Owner, without invalidating the Contract, may order changes in the Work consisting of Additions, Deletions, Modifications or Substitutions, with the Contract Sum and Contract completion date being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Professional, as the duly authorized agent, the Contractor and the Owner.

7.2 The Contract Sum and Contract Completion Date shall be adjusted only by a fully executed Change Order.

7.3 The additional cost, or credit to the Owner resulting from a change in the Work shall be by mutual agreement of the Owner, Contractor and the Architect. In all cases, this cost or credit shall be based on the ‘DPE’ wages required and the “invoice price” of the materials/equipment needed.

7.3.1 “DPE” shall be defined to mean “direct personnel expense”. Direct payroll expense includes prevailing wage rates plus a maximum multiplier of 1.35 times DPE. For example, if the prevailing wage rate is $50/hour, the DPE would be $67.50/hour (50 x 1.35).

7.3.2 "Invoice price" of materials/equipment shall be defined to mean the actual cost of materials and/or equipment that is paid by the Contractor, (or subcontractor), to a material distributor, direct factory vendor, store, material provider, or equipment leasing entity. Rates for equipment that is leased and/or owned by the Contractor or subcontractor(s) shall not exceed those listed in the latest version of the "Means Building Construction Cost Data" publication.

7.3.3 In addition to the above, the General Contractor is allowed a fifteen percent (15%) markup for overhead and profit for additional work performed by the General Contractor's own forces. For additional subcontractor work, the Subcontractor is allowed a fifteen (15) percent overhead and profit on change order work above and beyond the direct costs stated previously. To this amount, the General Contractor will be allowed a mark-up not exceeding seven and one half percent (7.5%) on the subcontractors work. These mark-ups shall include all costs including, but not limited to: overhead, profit, bonds, insurance, supervision, etc. No markup is permitted on the work of the subcontractors subcontractor. No additional costs shall be allowed for changes related to the Contractor's onsite superintendent/staff, or project manager, unless a change in the work changes the project duration and is identified by the CPM schedule. There will be no other costs associated with the change order.

ARTICLE 8: TIME

8.1 Time limits, if any, are as stated in the Project Manual. By executing the Agreement, the Contractor confirms that the stipulated limits are reasonable, and that the Work will be completed within the anticipated time frame.

8.2 If progress of the Work is delayed at any time by changes ordered by the Owner, by labor disputes, fire, unusual delay in deliveries, abnormal adverse weather conditions, unavoidable casualties or other causes beyond the Contractor's control, the Contract Time shall be extended for such reasonable time as the Owner may determine.

8.3 Any extension of time beyond the date fixed for completion of the construction and acceptance of any part of the Work called for by the Contract, or the occupancy of the building by the Owner, in whole or in part, previous to the completion shall not be deemed a waiver by the Owner of his right to annul or terminate the Contract for abandonment or delay in the matter provided for, nor relieve the Contractor of full responsibility

8.4 SUSPENSION AND DEBARMENT

8.4.1 Per Section 6962(d)(14), Title 29, Delaware Code, "Any Contractor who fails to perform a public works contract or complete a public works project within the time schedule established by the Agency in the Invitation To Bid, may be subject to Suspension or Debarment for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the Project."

8.4.2 "Upon such failure for any of the above stated reasons, the Agency that contracted for the public works project may petition the Director of the Office of Management and Budget for Suspension or Debarment of the Contractor. The Agency shall send a copy of the petition to the Contractor within three (3) working days of filing with the Director. If the Director concludes that the petition has merit, the Director shall schedule and hold a hearing to determine whether to suspend the Contractor, debar the Contractor or deny the petition. The Agency shall have the burden of proving, by a preponderance of the evidence, that the Contractor failed to perform or complete the public works project within the time schedule established by the Agency and failed to do so for one or more of the

following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the project. Upon a finding in favor of the Agency, the Director may suspend a Contractor from Bidding on any project funded, in whole or in part, with public funds for up to 1 year for a first offense, up to 3 years for a second offense and permanently debar the Contractor for a third offense. The Director shall issue a written decision and shall send a copy to the Contractor and the Agency. Such decision may be appealed to the Superior Court within thirty (30) days for a review on the record."

8.5 RETAINAGE

8.5.1 Per Section 6962(d)(5) a.3, Title 29, Delaware Code: The Agency may at the beginning of each public works project establish a time schedule for the completion of the project. If the project is delayed beyond the completion date due to the Contractor's failure to meet their responsibilities, the Agency may forfeit, at its discretion, all or part of the Contractor's retainage.

8.5.2 This forfeiture of retainage also applies to the timely completion of the punchlist. A punchlist will only be prepared upon the mutual agreement of the Owner, Architect and Contractor. Once the punchlist is prepared, all three parties will by mutual agreement, establish a schedule for its completion. Should completion of the punchlist be delayed beyond the established date due to the Contractor's failure to meet their responsibilities, the Agency may hold permanently, at its discretion, all or part of the Contractor's retainage.

ARTICLE 9: PAYMENTS AND COMPLETION

9.1 APPLICATION FOR PAYMENT

9.1.1 Applications for payment shall be made upon AIA Document G702. There will be a five percent (5%) retainage on all Contractor's monthly invoices until completion of the project. This retainage may become payable upon receipt of all required closeout documentation, provided all other requirements of the Contract Documents have been met.

9.1.2 A date will be fixed for the taking of the monthly account of work done. Upon receipt of Contractor's itemized application for payment, such application will be audited, modified, if found necessary, and approved for the amount. Statement shall be submitted to the Owner.

9.1.3 Section 6516, Title 29 of the Delaware Code annualized interest is not to exceed 12% per annum beginning thirty (30) days after the "presentment" (as opposed to the date) of the invoice.

9.2 PARTIAL PAYMENTS

9.2.1 Any public works Contract executed by any Agency may provide for partial payments at the option of the Owner with respect to materials placed along or upon the sites or stored at secured locations, which are suitable for use in the performance of the contract.

9.2.2 When approved by the agency, partial payment may include the values of tested and acceptable materials of a nonperishable or noncontaminative nature which have been produced or furnished for incorporation as a permanent part of the work yet to be completed, provided acceptable provisions have been made for storage.

9.2.2.1 Any allowance made for materials on hand will not exceed the delivered cost of the materials as verified by invoices furnished by the Contractor, nor will it exceed the contract bid price for the material complete in place.

9.2.3 If requested by the Agency, receipted bills from all Contractors, Subcontractors, and material, men, etc., for the previous payment must accompany each application for payment. Following such a request, no payment will be made until these receipted bills have been received by the Owner.

9.3 SUBSTANTIAL COMPLETION

9.3.1 When the building has been made suitable for occupancy, but still requires small items of miscellaneous work, the Owner will determine the date when the project has been substantially completed.

9.3.2 If, after the Work has been substantially completed, full completion thereof is materially delayed through no fault of the Contractor, and without terminating the Contract, the Owner may make payment of the balance due for the portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment that it shall not constitute a waiver of claims.

9.3.3 On projects where commissioning is included, the commissioning work as defined in the specifications must be complete prior to the issuance of substantial completion.

9.4 FINAL PAYMENT

9.4.1 Final payment, including the five percent (5%) retainage if determined appropriate, shall be made within thirty (30) days after the Work is fully completed and the Contract fully performed and provided that the Contractor has submitted the following closeout documentation (in addition to any other documentation required elsewhere in the Contract Documents):

9.4.1.1 Evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the work have been paid,

9.4.1.2 An acceptable RELEASE OF LIENS,

9.4.1.3 Copies of all applicable warranties,

9.4.1.4 As-built drawings,

9.4.1.5 Operations and Maintenance Manuals,

9.4.1.6 Instruction Manuals,

9.4.1.7 Consent of Surety to final payment.

9.4.1.8 The Owner reserves the right to retain payments, or parts thereof, for its protection until the foregoing conditions have been complied with, defective work corrected and all unsatisfactory conditions remedied.

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

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

Contractor shall take all reasonable precautions to prevent damage, injury or loss to: workers, persons nearby who may be affected, the Work, materials and equipment to be incorporated, and existing property at the site or adjacent thereto. The Contractor shall give notices and comply with applicable laws ordinances, rules regulations, and lawful orders of public authorities bearing on the safety of persons and property and their protection from injury, damage, or loss. The Contractor shall promptly remedy damage and loss to property at the site caused in whole or in part by the Contractor, a Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

10.2 The Contractor shall notify the Owner in the event any existing hazardous material such as lead, PCBs, asbestos, etc. is encountered on the project. The Owner will arrange with a qualified specialist for the identification, testing, removal, handling and protection against exposure or environmental pollution, to comply with applicable regulation laws and ordinances. The Contractor and Architect will not be required to participate in or to perform this operation. Upon completion of this work, the Owner will notify the Contractor and Architect in writing the area has been cleared and approved by the authorities in order for the work to proceed. The Contractor shall attach documentation from the authorities of said approval.

10.3 As required in the Hazardous Chemical Information Act of June 1984, all vendors supplying any materials that may be defined as hazardous, must provide Material Safety Data Sheets for those products. Any chemical product should be considered hazardous if it has a warning caution on the label relating to a potential physical or health hazard, if it is known to be present in the work place, and if employees may be exposed under normal conditions or in any foreseeable emergency situation. Material Safety Data Sheets must be provided directly to the Owner along with the shipping slips that include those products.

10.4 The Contractor shall certify to the Owner that materials incorporated into the Work are free of all asbestos. This certification may be in the form of Material Safety Data Sheet (MSDS) provided by the product manufacturer for the materials used in construction, as specified or as provided by the Contractor.

ARTICLE 11: INSURANCE AND BONDS

11.1 The Contractor shall carry all insurance required by law, such as Unemployment Insurance, etc. The Contractor shall carry such insurance coverage as they desire on their own property such as a field office, storage sheds or other structures erected upon the project site that belong to them and for their own use. The Subcontractors involved with this project shall carry whatever insurance protection they consider necessary to cover the loss of any of their personal property, etc.

11.2 Upon being awarded the Contract, the Contractor shall obtain a minimum of two (2) copies of all required insurance certificates called for herein, and submit one (1) copy of each certificate, to the Owner, within 20 days of contract award.

11.3 Bodily Injury Liability and Property Damage Liability Insurance shall, in addition to the coverage included herein, include coverage for injury to or destruction of any property arising out of the collapse of or structural injury to any building or structure due to demolition work and evidence of these coverages shall be filed with and approved by the Owner.

11.4 The Contractor's Property Damage Liability Insurance shall, in addition to the coverage noted herein, include coverage on all real and personal property in their care, custody and control damaged in any way by the Contractor or their Subcontractors during the entire construction period on this project.

11.5 Builders Risk (including Standard Extended Coverage Insurance) on the existing building during the entire construction period, may be provided by the Contractor under this contract. The Owner shall insure the existing building and all of its contents and all this new alteration work under this contract during entire construction period for the full insurable value of the entire work at the site. Note, however, that the Contractor and their Subcontractors shall be responsible for insuring building materials (installed and stored) and their tools and equipment whenever in use on the project, against fire damage, theft, vandalism, etc.

11.6 Certificates of the insurance company or companies stating the amount and type of coverage, terms of policies, etc., shall be furnished to the Owner, within 20 days of contract award.

11.7 The Contractor shall, at their own expense, (in addition to the above) carry the following forms of insurance:

11.7.1 Contractor's Contractual Liability Insurance

Minimum coverage to be:

Bodily Injury		
	$1,000,000	for each occurrence
	$3,000,000	aggregate
Property Damage	$1,000,000	for each occurrence
	$3,000,000	aggregate

11.7.2 Contractor's Protective Liability Insurance

Minimum coverage to be:

Bodily Injury		
	$1,000,000	for each occurrence
	$3,000,000	aggregate
Property Damage	$1,000,000	for each occurrence
	$3,000,000	aggregate

11.7.3 Automobile Liability Insurance

Minimum coverage to be:

Bodily Injury	$1,000,000	for each person
	$1,000,000	for each occurrence
Property Damage	$500,000	per accident

11.7.4 Prime Contractor's and Subcontractors' policies shall include contingent and contractual liability coverage in the same minimum amounts as 11.7.1 above.

11.7.5 Workmen's Compensation (including Employer's Liability):

11.7.5.1 Minimum Limit on employer's liability to be as required by law.

11.7.5.2 Minimum Limit for all employees working at one site.

11.7.6 Certificates of Insurance must be filed with the Owner guaranteeing fifteen (15) days prior notice of cancellation, non-renewal, or any change in coverages and limits of liability shown as included on certificates.

11.7.7 Social Security Liability

11.7.7.1 With respect to all persons at any time employed by or on the payroll of the Contractor or performing any work for or on their behalf, or in connection with or arising out of the Contractor's business, the Contractor shall accept full and exclusive liability for the payment of any and all contributions or taxes or unemployment insurance, or old age retirement benefits, pensions or annuities now or hereafter imposed by the Government of the United States and the State or political subdivision thereof, whether the same be measured by wages, salaries or other remuneration paid to such persons or otherwise.

11.7.7.2 Upon request, the Contractor shall furnish Owner such information on payrolls or employment records as may be necessary to enable it to fully comply with the law imposing the aforesaid contributions or taxes.

11.7.7.3 If the Owner is required by law to and does pay any and/or all of the aforesaid contributions or taxes, the Contractor shall forthwith reimburse the Owner for the entire amount so paid by the Owner.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.1 The Contractor shall promptly correct Work rejected by the Owner or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed, and shall correct any Work found to be not in accordance with the requirements of the Contract Documents within a period of two years from the date of Substantial Completion, or by terms of an applicable special warranty required by the Contract Documents. The provisions of this Article apply to work done by Subcontractors as well as to Work done by direct employees of the Contractor.

12.2 At any time during the progress of the work, or in any case where the nature of the defects shall be such that it is not expedient to have them corrected, the Owner, at their option, shall have the right to deduct such sum, or sums, of money from the amount of the contract as they consider justified to adjust the difference in value between the defective work and that required under contract including any damage to the structure.

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 CUTTING AND PATCHING

13.1.1 The Contractor shall be responsible for all cutting and patching. The Contractor shall coordinate the work of the various trades involved.

13.2 DIMENSIONS

13.2.1 All dimensions shown shall be verified by the Contractor by actual measurements at the project site. Any discrepancies between the drawings and specifications and the existing conditions shall be referred to the Owner for adjustment before any work affected thereby has been performed.

13.3 LABORATORY TESTS

13.3.1 Any specified laboratory tests of material and finished articles to be incorporated in the work shall be made by bureaus, laboratories or agencies approved by the Owner and reports of such tests shall be submitted to the Owner. The cost of the testing shall be paid for by the Contractor.

13.3.2 The Contractor shall furnish all sample materials required for these tests and shall deliver same without charge to the testing laboratory or other designated agency when and where directed by the Owner.

13.4 ARCHAEOLOGICAL EVIDENCE

13.4.1 Whenever, in the course of construction, any archaeological evidence is encountered on the surface or below the surface of the ground, the Contractor shall notify the authorities of the State Historic Preservation Office and suspend work in the immediate area for a reasonable time to permit those authorities, or persons designated by them, to examine the area and ensure the proper removal of the archaeological evidence for suitable preservation by the Division of Historical and Cultural Affairs.

13.5 GLASS REPLACEMENT AND CLEANING

13.5.1 The General Contractor shall replace without expense to the Owner all glass broken during the construction of the project. If job conditions warrant, at completion of the job the General Contractor shall have all glass cleaned and polished.

13.6 WARRANTY

13.6.1 For a period of two (2) years from the date of substantial completion, as evidenced by the date of final acceptance of the work, the contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect of equipment, material or workmanship performed by the contractor or any of his subcontractors or suppliers. However, manufacturer's warranties and guarantees, if for a period longer than two (2) years, shall take precedence over the above warranties. The contractor shall remedy, at his own expense, any such failure to conform or any such defect. The protection of this warranty shall be included in the Contractor's Performance Bond.

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 If the Contractor defaults or persistently fails or neglects to carry out the Work in accordance with the Contract Documents or fails to perform a provision of the Contract, the Owner, after seven days written notice to the Contractor, may make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor. Alternatively, at the Owner's option, and the Owner may terminate the Contract and take possession of the site and of all materials, equipment, tools, and machinery thereon owned by the Contractor and may finish the Work by whatever method the Owner may deem expedient. If the costs of finishing the Work exceed any unpaid compensation due the Contractor, the Contractor shall pay the difference to the Owner.

14.2 “If the continuation of this Agreement is contingent upon the appropriation of adequate state, or federal funds, this Agreement may be terminated on the date beginning on the first fiscal year for which funds are not appropriated or at the exhaustion of the appropriation. The Owner may terminate this Agreement by providing written notice to the parties of such non-appropriation. All payment obligations of the Owner will cease

upon the date of termination. Notwithstanding the foregoing, the Owner agrees that it will use its best efforts to obtain approval of necessary funds to continue the Agreement by taking appropriate action to request adequate funds to continue the Agreement."

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

EMPLOYEE DRUG TESTING REPORT FORM
Period Ending:_____

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds maintain testing data that includes but is not limited to the data elements below.

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____
_____
_____

Number of employees who worked on the jobsite during the report period:_____

Number of employees subject to random testing during the report period:_____

Number of Negative Results _____ Number of Positive Results _____

Action taken on employee(s) in response to a failed or positive random test:
_____
_____
_____

Date: _____

This form is not required to be submitted to the Owner. Included as a reference to show information required to be maintained by the Contractor. The Owner shall have the right to periodically audit all Contractor and Subcontractor test results at the Contractor's or Subcontractor's offices (or by other means to make the data available for inspection by the Owner).

EMPLOYEE DRUG TESTING
REPORT OF POSITIVE RESULTS

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds to notify the Owner in writing of a positive random drug test.

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____
_____
_____

Name of employee with positive test result: _____

Last 4 digits of employee SSN: _____

Date test results received: _____

Action taken on employee in response to a positive test result:
_____
_____
_____

Authorized Representative of Contractor/Subcontractor: _____
(typed or printed)

Authorized Representative of Contractor/Subcontractor: _____
(signature)

Date: _____

This form shall be sent by mail to the Owner within 24 hours of receipt of test results.

Enclose this test results form in a sealed envelope with the notation "Drug Testing Form – DO NOT OPEN" on the face thereof and place in a separate mailing envelope.

APPOQUINIMINK SCHOOL DISTRICT
DISTRICT OFFICE - LOWER-LEVEL RENOVATIONS
313 S FIFTH STREET, ODESSA, DELAWARE 19730

AFFIDAVIT OF
CRAFT TRAINING COMPLIANCE

We, the contractor, hereby certify that we and all applicable subcontractors will abide by the contractor and subcontractor craft training requirements outlined below for the duration of the contract. Craft training must be provided by a contractor and/or subcontractor for each craft on a project for which there are Delaware Department of Labor approved and registered training programs or, if the contractor and/or subcontractor meets the requirements under Title 29, Chapter 69, Section 6960A.(b)(1)c.1.-3., payment may be made in accordance with Title 29, Chapter 69, Section 6960A.(b)(1)d. A list of crafts for which there are approved and registered training programs is maintained by the Delaware Department of Labor and can be found at: https://laborfiles.delaware.gov/main/det/apprenticeship/DE%20Craft%20Training%20Occupation%20List%20Effective%20March%201%202022.pdf. If you have questions regarding craft training programs, please submit all questions in writing to the Delaware Department of Labor at: apprenticeship@delaware.gov. ***This Affidavit of Craft Training Compliance must be submitted prior to contract execution***.

In accordance with Title 29, Chapter 69, Section 6960A.(a)(1), a contract relating to a public works project under § 6962 of Title 29 must include a craft training program for each craft in the project if at the time the contractor executes a public works contract, all of the following apply:

a. A project meets the prevailing wage requirement under Section 6960 of Title 29.
b. The contractor employs 10 or more total employees.
c. The project is not a federal highway project, except for the project under Section 6962(c)(11) of Title 29.
d. There is an apprenticeship program for a craft in the project on the list of crafts under Section 204(b)(2) of Title 19.

Pursuant to Title 29, Chapter 69, Section 6960A.(a)(2), ***a contractor must commit that all subcontractors provide craft training*** if paragraph (a)(1) of this section applies to the subcontractor. Failure to provide required craft training or payment on the project may subject the successful contractor and/or subcontractor(s) to penalties as outlined in Title 29, Chapter 69, Section 6960A.(d)(1)-(3).

Craft(s): _____

Contractor Name: _____

Contractor Address: _____

_____

_____

Contractor Program Registration Number(s) _____
On this line also indicate whether DE, Other State (identify) or US Registration Number

Or

☐ **A payment has been made in the amount established under Section 204(b)(2)b.2. of Title 19, for the craft into the Delaware Department of Labor's Apprenticeship and Training Fund.**

Or

☐ **Craft Training requirements are not applicable because:**

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

State of Delaware)
) ss:
County of _____)

Before me, a notary public, in and for said county and state, personally appeared, _____, who acknowledged to me that she/he did execute the foregoing instrument on behalf of _____.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this ____ day of _____ 20___.

_____
Notary Public
Commission Expires _____

THIS PAGE MUST BE SIGNED AND NOTARIZED TO BE CONSIDERED.

SECTION 01 10 00

SUMMARY OF WORK

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. This Section includes the following:

1. Work covered by the Contract Documents.
2. Type of the Contract.
3. Use of premises.
4. Owner's occupancy requirements.
5. Work restrictions.
6. Specification formats and conventions.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

Project Identification: Appoquinimink School District Office – Lower Level Renovations

Project Location: 313 South Fifth Street, Odessa, DE 19730

Owner: Appoquinimink School District

1. Owner's Representative: Keith Hopkins, Construction Project Manager
2. Architect: R G Architects LLC., 200 West Main Street, Middletown, DE 19709

B. The Work consists of the following:

A. The project scope of work consists of, interior renovations and expanding portions of the existing office space. Interior renovations include the demolition of interior walls, ceiling systems, doors, mechanical, electrical & plumbing fixtures, and the construction of new walls, ceilings, fixtures & finishes.

1.4 USE OF PREMISES

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

1. Anticipated Schedule: It is anticipated that the physical work on site shall begin and conclude in approximately 26 weeks.

2. Owner Occupancy: Allow for Owner occupancy of Project site and use by the public.
3. Driveways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

    a. Schedule deliveries to minimize use of driveways and entrances.
    b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.5 OWNER'S OCCUPANCY REQUIREMENTS

A. Owner Occupancy: The owner will occupy portions of the site during construction and will need access to the building. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

B. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of site, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
3. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of site.

1.6 WORK RESTRICTIONS

A. On-Site Work Hours: Work shall be generally performed from outside the existing buildings during normal business working hours of 8:00 a.m. to 4:00 p.m., Monday through Friday, except for otherwise indicated.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.

1.7 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "MasterFormat" numbering system.
   1. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

   1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
   2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
      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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

GENERAL SCOPES OF WORK (All Trades)

All work is to be done in accordance with the Contract Documents, including the drawings and the specifications, this scope of work, and all addenda, if any. Each trade must comply fully with all sections of the Division 1 general requirements.

This scope is intended as a reference to assist in the bidding process. The Contractor is responsible for all labor, material, tools, equipment, hoisting, storage, layout, incidental work, and associated services necessary to fully complete all of the work described and shown in the Contract Documents. This contractor is responsible to review and include all items in their attached **specific scope** of work and to also review the work of other trades.

This work includes but is not limited to:

Bid Packages

02A - Demolition
03A – Concrete, Masonry, Slab Caulking
08B – Glass
09A – General Trades
09B – Flooring
09C – Painting
12A – Roller Shades
~~**12B – Casework**~~
22A – Plumbing / HVAC
26A – Electrical

Liquidated Damages

1. None at this time

Soil Report

1. Geotechnical Data - none

Schedule / Sequence of Work

1. See Master Bid Schedule
2. Submittals and shop drawings shall be produced in an order that allows the building to follow the Master Bid Schedule.
3. Deliveries shall follow the Master Bid Schedule. Partial deliveries may be required. If a bidder intends to deliver materials in quantities that affect other's work access, such intentions shall be made known prior to award. See the Code Plan for access, parking, general Site Access.

Project Phasing (General Description)

1. Project to be 1 Phase

General Scope Items: For all trades, all trades must abide

1) Contractors shall be licensed to work in Delaware, New Castle County and be registered with the DE Dept of Labor.
2) All applicable sales, use, gross receipts & excise taxes.
3) This is a wage rated project.
4) Include reproduction cost for contract documents and shop drawings.
5) All Trade Contractors shall provide Owner with a complete submittal schedule listing all submittals in this Trade Contractor's scope of work within 10 days of notice to proceed.
6) Contractors will be required to provide **multiple crews** and equipment to perform work as sequenced on the Master Construction bid schedule.
7) The Master Construction bid schedule section also includes several site logistics & sequence sketches showing the specific direction of all building trades. Bid impacts accordingly.
8) After bids are received, contractors will need to attend a scope review meeting with the Owner, and the Architect. Apparent low bidders will be contacted in approx. 1-2 days after bids are due.
9) Your subcontractors must be listed on the bid form. All subcontractors must be properly State licensed and insured as well as fully meet specified installer qualifications. If a listed subcontractor is not used, Owner will require subcontractor to submit a letter of withdraw for review and approval.
10) All contractors are responsible for the full set of drawings & specifications.
11) **On-site work hours are 7:00am to 3:30pm Mon thru Fri This includes deliveries to the site.**
12) Each contractor, upon award, is to forward the invoice Schedule of Values.
13) **This contractor will execute an Owner contract with no changes. This contractor recognizes that it is a 'Prime' contractor.**
14) Extra Work – pricing & allowable markups must abide by contract documents and the following (Reference section 006400 for additional information):
    - pricing is due within 5 days of request
    - Owner requires certified payroll reports (on or about that week) accompany all extra work pricing submissions. This way, for work being priced and approved prior to taking place, the actual rate for the mechanics on the project can be verified. It will be assumed that those mechanics will be the ones likely to perform the work, when approved.
    - Owner requires certified payroll reports (for that week specifically) accompany all T&M extra work pricing submissions. This way, the actual mechanic's rate used will be cross checked.
    - Subcontractors shall not proceed with extra work without WRITTEN DIRECTION from Owner project manager. Proceeding without the proper written direction will forfeit your right to reimbursement.
15) This subcontractor is responsible for all of the existing building and /or site conditions in existence as of the bid due date. These conditions may not be identified on the drawings or in this scope of work. Examine prior to the bid.
16) Jobsite security and security of materials is the responsibility of each contractor, not Owner. Store materials off-site or in trailers if there is a security concern. Storage

of materials in the building is very limited. Contractors should rent storage trailers as needed.

17) Contractors are responsible to provide all surveying & layout required for their scope of work.
18) Core drilling, cutting & patching as required to perform work. Include restoration of surfaces to original condition if required. Cutting to be performed as to minimize patching.
19) Provide pipe sleeves at all wall intersections, for all pipes.
20) Sealants, caulking, and fire stopping integral with work. MEP trades must fire stop your penetrations. Fire stop work shall be performed once the above roof is watertight.
21) Permit fees, licenses, testing and inspection required for work other than the building permits. Testing for soil compaction, structural steel and concrete will be performed by owner's testing agency and aid as specified.
22) Temporary lighting, power & water as required for your work. Connection to temporary panel services is permitted, with written permission, however, it must not adversely affect Project functions. Pay to install and remove all temporary services.
23) Scaffolding, lifts, cranes, and other means of hoisting or access for your own work. For bidding purposes, the elevator will not be available to move materials or trash, unless specifically granted in your scope of work.
24) All utility piping must have ends capped or sealed off until installed and backfilled. Either factory caps or site installed plastic wrap is ok.
25) Submittals and mock-ups as specified.
26) Insurance per Owner contract. Maintain throughout project and warranty periods. Professional liability insurance for any design/engineering work.
27) Attachment or hangers to other trade's work (floors, trusses, joists, roofing, brick, steel, etc) must abide by structural drawings & manufacture's design / warranty requirements.
28) Abide by all directions of the Fire Department in matters affecting life safety and fire prevention measures. Do not block stairs, hallways, doorways, exits or fire roads.
29) Parking must follow Owner requirements and is subject to change.

Clean up

30) All subcontractors are responsible for daily cleanup and broom sweep of their debris to the jobsite dumpster. This means that no trash or left-over construction materials can be left on site or in buildings at the end of the day, including scrap metals. The building is occupied, clean-up is a Life Safety requirement.

P M's duties, etc.

31) Each project manager is required to have and use an email address that they check at least once per day.
32) The project manager and foreman will need to meet with the Owner's rep for a "pre-start" job meeting.
33) Attendance at any Progress Coordination meetings by your project manager is mandatory while working onsite. Meetings may be recorded.

34) All change order pricing must be accompanied by a labor and material breakdown and with subcontractor quotes.
35) Material deliveries need to arrive on site a minimum of 2 weeks before the bid scheduled installation date. Space on site is minimal so coordination of quantities and location either on site or off is critical.
36) Manpower and equipment must be supplied to the project at numbers sufficient to meet the bid schedule's simultaneous tasks, speed, sequence, and duration.

Foremen's duties, etc.

37) The contractor must have on site, at all times during own work, a supervisor or foreman responsible to coordinate the work with all other trades to meet the project schedule and perform the work to meet the contract documents. If subcontractor has multiple crews onsite, one person shall be designated as the lead foreman to manage separate crews.
38) Language Requirements – All Trade Contractors are to provide at least one bi-lingual crew member for translations if any crew member does not speak English. At a minimum, all Trade Foremen are required to speak English.
39) The foreman is directly responsible for the sub's clean up requirements, see above.
40) The foreman and project manager will need to meet with the Owner for a "pre-start" job meeting.
41) Contractors are required to coordinate with other trades and with Owner.
42) Each day, foreman shall report to Owner's rep and check for written information or direction.
43) Each foreman is required to complete daily field reports and turn them into Owner daily. This report states where and what work was performed.
44) All subcontractor employees will meet with Owner's superintendent for a short safety orientation upon starting their work on site. All subcontractor employees are required to attend this orientation.
45) Storage space is limited on the property. Materials and gang boxes cannot be in the way of other trades, traffic, fire lanes, project functions, access, etc. Review location and requirements with WT. Provide storage trailers or off site storage when necessary.
46) As-built drawings should be maintained on the job-site and updated on a daily basis for review by Owner. All underground utilities must use GPS coordinates.
47) Care must be taken to not mark or damage finished surfaces. Temporarily protect the owner's property. Contractors will be back charged or will need to pay for repairs to the work of others.
48) **Deliveries** – all deliveries shall be coordinated with WT for placement 2 days in advance.
49) **Parking** is available on site and must be in compliance with WT requirements. Foreman is responsible to enforce the approved plan.

Safety items, etc.

50) Hangers on floors, steel, bar joists or roof trusses must comply with requirements of those vendors.
51) Lifts **can not be used** on upper building floors, use scaffolding. Review the structural drawings for any and all load restrictions and requirements.

52) No gasoline-powered equipment can be used at any time within buildings, use propane instead.
53) Protection of rebar tops is the responsibility of the contractor who supplied associated rebar (In all cases).
54) MSDS must be forwarded prior to starting work. No chemicals can be used at any time without properly reviewing them with Owner first.
55) Contractors are required to comply with all safety regulations as required by OSHA, Whiting-Turner, TCPS and as noted in the specifications. Provide all safety devices necessary for your work including fall protection.
56) All safety, barricades, floor opening protection, etc., installed by this contractor or by others, is the responsibility of this contractor if moved or damaged by this contractor.
57) The successful contractor must forward Owner a copy of their safety program.
58) During this project, hot work permits will need to be obtained from Owner prior to proceeding with any such work.
59) Any and all utility trenches left open overnight will need to have temp plywood covers installed. Contractor shall supply the panels required for their work.

Invoicing, Commissioning, Contract close out, etc.

60) Commissioning will be performed on all install equipment and items that function. See your spec sections for individual requirements.
61) Each contractor must have a line item on their invoice Schedule of Values that allows 1% of the total contract amount for close-out documents (as-builts, warranties, operations and maintenance manuals, punchlists, etc.) in addition to 10% retention.
62) Invoices are due no later than 20th of each month.
63) Mobilization values must not exceed industry recognized costs to move materials in or out.
64) Provide all testing, guarantees, warranties, as-built drawings, O&M manuals, commissioning tests, close-out documentation, and start-up services necessary to put all work into first class operating condition per the contract documents including any final cleanup required.
65) Furnish attic stock if required by the drawings, specifications, or the scope of work.
66) Building or site commissioning is to be performed separately from owner's training.
67) Warrantees as specified commencing on date of substantial completion however, All trades, especially MEP, will be required to provide extended warranties, as the equipment will be put into service far ahead of the substantial completion date, warranty period shall start once Owner identifies the building as substantially complete. See the master bid schedule for the dates that affect your items.
68) At contract completion, contractor must complete sets of close-out documents consisting of as-built drawings, electronic drawing files, operation and maintenance manuals, start-up logs, warranty letters, certificates of inspection, owner's training video and a detailed transmittal of attic stock as required for all work performed under contract.
69) Owner's Training is required whether or not required by specifications.

70) All subcontractors will be bound to the Owner contract requirements, also. This shall be the Standard AIA document A132-2019, no changes.

End of General Scope Items
Specific Scope items follow

BID PACKAGE #02A DEMOLITION

A. This Bid Package includes work for the District Office Renovations. The bidder must review all sets of bid documents and bid schedules.

B. The provisions outlined in the General Scope of Work shall apply to all items of this section.

C. The Scope of Work includes all labor, material, tools, equipment, storage, planning, coordination, engineering, unloading, supervision, and other items necessary to furnish and install Concrete materials as described and shown on the Contact Documents, including but not limited to the following:

Section: Description

Applicable specification sections: This work primarily includes but is not limited to the following specification sections as well as related work specified or shown elsewhere in the contract documents:

DIVISION 00 - CONTRACT REQUIREMENTS

Sections
In Its Entirety

DIVISION 1 – GENERAL REQUIREMENTS

Sections
In Its Entirety

DIVISION 02 – EXISTING CONDITIONS

Sections
In Its Entirety

SPECIFIC PERFORMANCE REQUIREMENTS ITEMS

1. This contractor is required to coordinate all your work with other trades as well as any Owner's direct hire trades. CM will be procuring the Building Permit
2. This contractor will be demolishing the glass window walls (Base bid + Alt #1). However, this work will happen at the time the new windows are delivered to the project. Include a second mobilization.

SPECIFIC SCOPE ITEMS

The scope below has been separated into sub-sections for clarity but each line applies to this scope of work in its entirety (i.e. clean up is required for all activities). Furnish and install all required labor, equipment & materials to complete this project including, but not necessarily limited to, the following:

Specific Scope of Work: Demolition

1. Provide dumpsters for removal of all demolition debris
2. The 26A - Electrical sub will cut / cap and drop all electrical items to be demolished (lights, conduits, wires, fire alarm devices). You clean up and toss in your dumpster. They own any scrap rights.
3. The 22A - Plumbing / HVAC sub will cut / cap and drop all above ceiling Mechanical items to be demolished (duct, hangers, pipes, insulation). You clean up and toss in your dumpster. They own any scrap rights.
4. The 08A glass contractor will assist with demolition of the glass window walls. You perform all actual demo, clean up and toss in your dumpster
5. Saw cut & demolish the masonry walls below the window wall locations, per drawings.
6. Perform all demolition notes shown on Drawings A1.0 and A1.1, and as follows:
    a. Remove all ceiling grid, tile, diffusers, registers. All items part of the ceiling in rooms or areas where new ceilings are shown to be installed.
    b. Remove exterior plaster ceilings neatly where new glass windows get installed.
    c. At new masonry openings, full depth saw cut for new door frame size + new masonry lintel. Mason will cut the tooth in work
    d. Remove the flooring shown plus all rubber base. Scrape the floors smooth. No floor prep.
    e. Where walls are removed, scrape smooth where the old wall was. Same at floor.
    f. Where old walls are removed, remove any wall braces above the ceilings
    g. Remove all on wall bulletin boards, white boards, tack boards and all fasteners.

7. Plumbing sub will lay out floor cutting for the new below slab sanitary lines. You will full depth saw cut the slabs (5" thick), break, remove and haul out all debris. See drawings P1.1 for exact sizes and locations.
    - You will be required to x-ray or use ground penetrating radar, to survey the areas to be removed, so as to avoid cutting any electrical conduits running under the slab.

Dust Protection

1. Provide dust protection and fans to evacuate dust during all work. Extremely important during all masonry or concrete saw operations. The Building is occupied.

Final Clean up

1. Perform final broom sweep clean up of all rooms. In Hallways and stairways, sweep and shop vac all surfaces.

WORK BY OTHERS

1. Cut and drop MEP items. You own clean up all to your dumpster.
2. Pour concrete back at new sanitary lines

ALTERNATE PRICING:

Submit with your bid the following alternative pricing. Insert the costs/descriptions in the spaces provided on the bid forms.

Alternate No. 1 – Deduct Demo & haul out the window walls shown. This includes any exterior plaster ceiling soffits for the new work and brick pavers.

Alternate No. 2 – Deduct The new coffee bar area.

Alternate No. 3 – none

Alternate No. 4 – Remove existing ceiling in first floor bathrooms.

ALLOWANCE PRICING:

Include in your base bid the following FULL allowance costs, including all supervision, overhead and profit, etc. Monies not used will be credited back at end of work:

Allowance No.1: include $5,000, to be used T&M for misc trash or furniture disposal

UNIT PRICES: Please fill in all unit bid prices on the bid form except building concrete items. Unit prices will be used to adjust for additional work added or deducted during the course of the project.

1. Additional saw cut concrete slab per linear foot Add $_____ / LFT
2. Additional concrete slab breaking & haul out, per square foot Add $_____ / sft
3. Additional drywall partition demo, full height per linear foot Add $_____ / LFT

END OF SECTION

BID PACKAGE #03A CONCRETE, MASONRY, SLAB CAULK

A. This Bid Package includes work for the District Office Renovations. The bidder must review all sets of bid documents and bid schedules.

B. The provisions outlined in the General Scope of Work shall apply to all items of this section.

C. The Scope of Work includes all labor, material, tools, equipment, storage, planning, coordination, engineering, unloading, supervision, and other items necessary to furnish and install Concrete materials as described and shown on the Contact Documents, including but not limited to the following:

Section: Description

Applicable specification sections: This work primarily includes but is not limited to the following specification sections as well as related work specified or shown elsewhere in the contract documents:

DIVISION 00 - CONTRACT REQUIREMENTS

Sections
In Its Entirety

DIVISION 1 – GENERAL REQUIREMENTS

Sections
In Its Entirety

DIVISION 03 – CONCRETE

Sections
In Its Entirety

Termite Control

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

Sections
07 21 00 BUILDING INSULATION (perimeter under slabs)

SPECIFIC PERFORMANCE REQUIREMENTS ITEMS

1. This contractor is required to coordinate all your work with other trades as well as the Owner's direct hire trades. CM will be procuring the Building Permit
2. This contractor must coordinate all it's work so as to allow access to building and tasks of all other contractors on site. See Master Bid Schedule.

SPECIFIC SCOPE ITEMS

The scope below has been separated into sub-sections for clarity but each line applies to this scope of work in its entirety (i.e. clean up is required for all activities). Furnish and install all required labor, equipment & materials to complete this project including, but not necessarily limited to, the following:

Specific Scope of Work: Concrete

1. Arrange for and coordinate Miss Utility and other applicable entities in the identification of existing utilities and their location.
2. Coordinate inspections needed including but not limited to, rebar, concrete, compaction, etc. with Whiting-Turner Superintendent 2 days in advance to guarantee inspector onsite.
3. Include the cost to haul off and dispose of both concrete and earth spoils, in a legal manner, all excess materials from the work described herein.
4. Provide full-time onsite superintendent to monitor and supervise work described herein. The project manager assigned to this work is required to visit the site a minimum of two times a week. When the Project Manager is onsite he must meet with Whiting-Turner superintendent and project manager.
5. Provide, maintain and remove all formwork, bracing required to accomplish the work described herein. Provide enough forms and equipment to perform foundation work at multiple areas simultaneously.
6. Provide all concrete accessories, including but not limited to, expansion joint fillers, water stops, concrete inserts, vapor retarder, etc. required to accomplish the work described herein.
7. Provide all cast-in-place concrete associated with the new room additions including but not limited to, footings, piers, slab-on-grade, etc.
8. Fill all holes in concrete that is left exposed in finish areas.
9. Coordinate with the appropriate contractors regarding sizes and specific locations of any embeds.
10. Provide any weather protection, curing measures, and hot and cold concreting procedures including but not limited to, blankets, sheet plastic, etc. per ACI Standards.
11. This contractor to provide layout for new footings and slab off the existing building exterior lines. Stakeout is not provided. A final building as-built will be surveyed by the CM.
12. Provide, maintain and remove a curing box.
13. Provide access ladders for own work.
14. Provide protection and cleaning of adjacent areas to remain exposed.
15. Provide temporary power, electric and lighting required for accomplishing the work described herein.
16. Provide all reinforcing and reinforcing accessories including but not limited to, tie wire, splicing requirements, chairs or other approved support methods, etc.
17. Provide below slab perimeter insulation.

18. Curing compounds, sealers, and hardeners. All items used should be compatible with the finish floor material to be placed on top of them.
19. Control joints and concrete accessories
20. In analyzing the project schedule it should be assumed it will take approximately two (2) weeks after receipt to review shop drawings
21. Concrete reinforcing & WWF and accessories as required.
22. Set any embedded items (anchor bolts, angles, plates, anchors, etc.)
23. Maintenance of traffic and pedestrian protection for this work
24. Slope concrete slabs to floor drains or drainage at slab edges. Coordinate with finish floor thickness.
25. Provide and pay for all lifting and hoisting.
26. Provide and maintain rebar cap for exposed rebar.
27. Provide wash down pit for concrete trucks and haul off excess concrete off site.
28. Provide slab-on-grade, stone, vapor barrier, under slab insulation, reinforcing bar and/or mesh as required.
29. All excavation, backfill and haul off of excess, other than bulk excavation, is by this contractor.
30. Footings must be poured the day they are dug (to prevent flooding).
31. Provide for rain water pumping and mucking of the foundations, footings and pits including but not limited to mucking, hoses, pumps, power, sediment control, hoses, fuel, etc. required to accomplish the work described herein. Maintain and remove sumps pits, as necessary for this contractors work.
32. Refer to architectural and structural drawings for clarification and reference.
33. By submitting a bid it is assumed that this contractor has visited the site and is familiar with the requirements of this project.
34. Any metal debris must be put in the scrap metal dumpster
35. Furnish and install stone base, , expansion joints, sealants, and reinforcement for this work.
36. Drill and epoxy the new rebar into concrete. See 'S' drawing details. (This is required where your new Footing / turn down edge slab hits all existing footings).
37. Removal and proper disposal of spoils, debris and excess materials. Do not dispose in CM's dumpster.

Excavation & Backfill

38. This contractor will Excavate and backfill for the footing work, both interior & exterior.
39. Maintain, and repair temporary soil erosion and sediment controls, including the stabilized entrance(s), disturbed as a result of the work described herein, including but not limited to repair of temporary seeding, silt fencing, inlet protection, stabilized entrance, etc. Provide for the cleaning of streets and sidewalks if dirtied by the operations distributed herein.
40. This Contractor will prepare the building pad to sub grade elevation. include fine grading, proof rolling and haul off of excess material required to accomplish the work described herein.
41. This contractor to include termite control necessary for the project. You own the termite control.

Weather Protection

1. Consult the master bid schedule for various pours and their time of year. Include and mix heating, ice, admixtures, etc that are industry standard to work at those times. Blanket, protect and cure as required properly.
2. Tenting and heating for ALL slab on deck locations will be by T&M allowance, if those pours are scheduled to occur in December, January or February.

Slab Flatness

1. Specified slab flatness is mandatory, please comply.

Dust Protection

1. Provide dust protection and fans to evacuate dust during all work. Extremely important during all masonry or concrete saw operations. The building is occupied.

Masonry

1. Provide the brick patching at the existing brick walls and columns, see Note 12 drawing a1.0.
2. Salvage bricks for the patching during the demolition work. use mortar to match the color.
3. Wash down all patch areas.

Caulking

1. Caulk slab joints where new slab meets existing, see detail 3/a3.2. , typical.

Final Clean up

1. Perform final broom sweep clean up of all rooms. In Hallways, sweep and shop vac all surfaces.
2. Haul out all left over materials and sand 100%

WORK BY OTHERS

1. See other scopes

ALTERNATIVE PRICING:

Submit with your bid the following alternative pricing. Insert the costs/descriptions in the spaces provided on the bid forms.

Alternate No. 1 - Deduct Slab at the new window walls shown.

ALLOWANCE PRICING:

Include in your base bid the following FULL allowance costs, including all supervision, overhead and profit, etc. Monies not used will be credited back at end of work:

Allowance No.1: include $5,000, to be used T&M for additional work

UNIT PRICES: Please fill in all unit bid prices on the bid form except building concrete items. Unit prices will be used to adjust for additional work added or deducted during the course of the project.

1. Additional excavation of existing soil & haul off Add $_____ / CYD
2. Additional backfill with select, compacted in place Add $_____ / CYD
3. Additional concrete in footing Add $_____ / CYD
4. Additional concrete in foundation wall, formed height shown Add $_____ / LFT

END OF SECTION

BID PACKAGE #08A GLASS

A. This Bid Package includes work for the District Office Renovations. The bidder must review all sets of bid documents and bid schedules.

B. The provisions outlined in the General Scope of Work shall apply to all items of this section.

C. The Scope of Work includes all labor, material, tools, equipment, storage, planning, coordination, engineering, unloading, supervision, and other items necessary to furnish and install Concrete materials as described and shown on the Contact Documents, including but not limited to the following:

Section: Description

Applicable specification sections: This work primarily includes but is not limited to the following specification sections as well as related work specified or shown elsewhere in the contract documents:

DIVISION 00 - CONTRACT REQUIREMENTS

Sections
In Its Entirety

DIVISION 1 – GENERAL REQUIREMENTS

Sections
In Its Entirety

DIVISION 08 – OPENINGS

Sections

08 41 13	ALUMINUM FRAMED STOREFRONTS
08 71 00	DOOR HARDWARE
08 80 00	GLAZING

SPECIFIC PERFORMANCE REQUIREMENTS ITEMS

1. This contractor is required to coordinate all your work with other trades as well as any Owner's direct hire trades. CM will be procuring the Building Permit
2. This contractor will be dismantling the glass window walls (Base bid + Alt #1). The Demo firm will clean up & toss all debris. However, this work will happen at the time the new windows are delivered to the project. This becomes your mobilization date.

SPECIFIC SCOPE ITEMS

The scope below has been separated into sub-sections for clarity but each line applies to this scope of work in its entirety (i.e. clean up is required for all activities). Furnish and install all

required labor, equipment & materials to complete this project including, but not necessarily limited to, the following:

Specific Scope of Work: Storefront work

1. Furnish and install all new glass and aluminum doors, frames, hardware, and glazing assemblies per the door schedule, the details, and the notes. Glass door hardware is by you.
2. Delivery and unloading of glass, doors, frames, and hardware.
3. Upon delivery of all new window frames AND glass, this contractor will be dismantling the glass window walls (Base bid + Alt #1). The Demo firm will clean up & toss all debris. This becomes your mobilization date.
4. Doors and frames should be fully prepped to receive new hardware and glass. Coordinate fabrication of doors and frames with preparations for all finish hardware and openings
5. Provide any field measuring, shop drawings, hardware schedule, labels on doors, labels on hardware, etc. Properly label all finish hardware by set number and number all doors to align with the corresponding door number on the contract drawings
6. Furnish and install any electric hardware for glass doors. Provide shop drawing elevations showing location and side of all electric or security hardware. Provide raceways within doors/ frames for any wiring to electrical hardware. Coordinate with electrical contractor to insure that provisions are compatible with electrically operated hardware components.
7. Furnish installation instructions for proper installation of all materials and products. Furnish all applicable product data
8. Provide fire ratings per contract documents and provide UL labels on all rated components
9. Furnish clips, temporary space bars, angles, fasteners and special tools as required for installation and maintenance.
10. This contractor shall caulk the exterior side of all exterior windows.
11. Provide construction cylinders/cores for all new doors.
12. Furnish and install the ballistic glazing called for, all all locations required
13. Furnish any attic stock.
14. Fill out the manufacturer / installer listing in the specifications.

Shop Drawings / Structural

1. Your shop drawings need to detail the attachment method utilized at the other window locations on the existing pre-fab brick wall panels. Comply with the original brick panel shop drawings. Wood blocking is by others but show this clearly on your shops.

Other misc items

1. Furnish and install the loose glass vision panels for all D3 type doors

Temp Protection

1. Provide temp protection to avoid any damage to surrounding finish items

Final Clean up

1. Perform daily and final clean up of all work areas. Ensure no objects are left on the project.

WORK BY OTHERS

1. In wall or in ceiling blocking. Coordinate if needed.

ALTERNATIVE PRICING:

Submit with your bid the following alternative pricing. Insert the costs/descriptions in the spaces provided on the bid forms.

Alternate No. 1 - Deduct Demo the window walls shown.

ALLOWANCE PRICING:

Include in your base bid the following FULL allowance costs, including all supervision, overhead and profit, etc. Monies not used will be credited back at end of work:

Allowance No.1: None

UNIT PRICES: Please fill in all unit bid prices on the bid form except building concrete items. Unit prices will be used to adjust for additional work added or deducted during the course of the project.

1. cost to replace the largest exterior glass lite, due to breakage by others
   ADD $_____ ea

END OF SECTION

BID PACKAGE #09A GENERAL TRADES

A. This Bid Package includes work for the District Office Renovations. The bidder must review all sets of bid documents and bid schedules.

B. The provisions outlined in the General Scope of Work shall apply to all items of this section.

C. The Scope of Work includes all labor, material, tools, equipment, storage, planning, coordination, engineering, unloading, supervision, and other items necessary to furnish and install Concrete materials as described and shown on the Contact Documents, including but not limited to the following:

Section: Description

Applicable specification sections: This work primarily includes but is not limited to the following specification sections as well as related work specified or shown elsewhere in the contract documents:

DIVISION 00 - CONTRACT REQUIREMENTS

Sections
In Its Entirety

DIVISION 1 – GENERAL REQUIREMENTS

Sections
In Its Entirety

DIVISION 09 – FINISHES

Sections

Rough Carpentry
- 06 10 00 ROUGH CARPENTRY

Doors, Frames, Hardware
- 08 11 13 HOLLOW METAL DOORS AND FRAMES
- 08 14 16 FLUSH WOOD DOORS
- 08 71 00 DOOR HARDWARE

Framing & Drywall
- 09 22 16 NON-STRUCTUAL METAL FRAMING
- 09 29 00 GYPSUM BOARD

Acoustic Ceilings
- 09 51 13 ACOUSTIC PANEL CEILINGS

Specialties
- 10 14 23 PANEL SIGNAGE
- 10 21 13 PLASTIC TOILET COMPARTMENTS
- 10 28 00 TOILET, BATH, AND LAUNDRY ACCESSORIES
- 10 44 13 FIRE PROTECTION CABINETS
- 10 44 16 FIRE EXTINGUISHERS

Furnishings
12 32 00 MODULAR CASEWORK

SPECIFIC PERFORMANCE REQUIREMENTS ITEMS

1. This contractor is required to coordinate all your work with other trades as well as the Owner's direct hire trades.

SPECIFIC SCOPE ITEMS

The scope below has been separated into sub-sections for clarity but each line applies to this scope of work in its entirety (i.e. clean up is required for all activities). Furnish and install all required labor, equipment & materials to complete this project including, but not necessarily limited to, the following:

Specific Scope of Work: GENERAL TRADES

ROUGH CARPENTRY

1. Furnish and install any wood blocking at door and window openings, heads, jambs, and sills as shown.
2. This contractor shall provide all in wall blocking for casework, visual display surfaces, signage, toilet accessories, toilet compartments, roller shade equipment, shelving, mirrors, grab bars, fire extinguisher cabinets/mounts, etc.
3. Contractor shall provide any temporary protection of the building envelope as needed.
4. This contractor shall provide and install temporary wall between Hall 115 and Lobby 100 to separate construction area from occupied spaces.
5. Contractor to provide all roof blocking as noted on the drawings and in specifications. Including blocking, nailers, and rooftop equipment bases and support curbs.
6. Furnish and install all accessories necessary for blocking installation, plywood backing panels, and framing as shown on drawings and in specifications.
7. In wall blocking shall be wood, not sheet metal. Blocking to be 2x or Danback only.

DOORS, FRAMES, HARDWARE

8. Furnish and install all new wood and hollow metal doors, sliding doors, borrow lites, frames, hardware, and vision panel assemblies per the door schedule, the details, the specifications, and the notes. Glass door hardware is by others. Reference Drawing A4.1 for the door schedule/elevations.
9. Delivery and unloading of doors, frames, and hardware.
10. Doors and frames should be fully prepped to receive new hardware and glass.
11. Provide any field measuring, shop drawings, hardware schedule, labels on doors, labels on hardware, etc. Properly label all finish hardware by set number and number all doors to align with the corresponding door number on the contract drawings.
12. Provide shop drawing elevations showing location and side of all electric or security hardware.
13. Coordinate fabrication of doors and frames with preparations for all finish hardware and openings.
14. Furnish installation instructions for proper installation of all materials and products. Furnish all applicable product data.

15. Provide fire ratings per contract documents and provide UL labels on all rated components
16. Provide raceways within doors/ frames for any wiring to electrical hardware.
17. Furnish clips, temporary space bars, angles, fasteners and special tools as required for installation and maintenance.
18. Provide construction cylinders/cores for all new doors.
19. Furnish permanent cylinders/cores keyed to owner requirements for all new doors.
20. Coordinate with electrical contractor to ensure that provisions are compatible with electrically operated hardware components.
21. Prefinish all wood doors.
22. Furnish any attic stock.

FRAMING AND DRYWALL

23. Provide and install all non-structural metal framing for interior partitions and suspension systems for interior ceilings and soffits. All framing systems must be in accordance with the drawings and specifications.
24. Provide all studs, tracks, framing members, channels, backing plates, and all accessories needed for installation.
25. Provide and install all structural framing as required by the contract documents.
26. Provide and install an anchor down steel post in the half wall, see drawing a1.2.
27. This contractor to furnish and install all gypsum board shown on the drawings and in specifications.
28. Coordinate with the painting contractor related to patching and prep for finishes as follows:
29. Drywall subcontractor will complete final sanding of drywall and ceilings.
30. Painting subcontractor to apply the prime coat.
31. Drywall and painting subcontractors to walk the entire area and review drywall quality. Imperfections will be identified and circled in pencil.
32. Drywall contractor will repair all circled imperfections, walls and ceilings.
33. Painter will spot prime repairs, walls and ceilings.
34. Painter will proceed with application of the first coat.
35. Painter will complete final coat by means of rolling and/or brushing over protected finished floors.
36. Provide and install acoustical rated insulation at all interior rated partitions.
37. This contractor to provide and install tile backing panels, trim accessories, joint treatment materials, fasteners, etc.
38. Contractor to finish ceiling plenum and other concealed areas to Level 2 Finish, storage and mechanical areas to Level 4 Finish, and all other areas to a Level 5 Finish.

ACOUSTICAL CEILINGS

39. Provide and install all new ACT type ceiling tile, metal ceilings and various grids per the reflected ceiling drawings, the finish schedule, specifications, and all notes.
40. Reference drawings a1.1c and a1.2 for RCP plans.
41. Coordinate ceiling grid and wall angle systems with the wall types. All work must be coordinated with other trades, especially the drywall and framing contractor.

42. Cut tiles for electrical, fire protection, HVAC, security and other trades. Coordinate with MEP drawings for locations of components in ceiling.
43. Provide floor protection (plywood, rubber mats, etc.) in areas where scaffold/ladders may damage floors or substrates.
44. You own layout for the suspended ceiling systems, as well as bracing and hangers.
45. Furnish and install any above ceiling insulation.
46. Provide attic stock.
47. Expansion and control joints in ceiling construction integral with this work.
48. Touch-up painting of cut ceiling tile edges where exposed.
49. Clean tiles and other surfaces upon completion of installation. Replace any panels that cannot be cleaned and/or repaired.
50. Verify that air and surface temperature, moisture, & humidity conditions are suitable for installation of this work.

SPECIALTIES

51. Furnish and install all interior room signage and interior informational signage. Reference specifications for interior signage schedule.
52. Furnish and install all plastic toilet compartments and urinal screens. Provide factory fabricated doors, panels, and pilasters. Provide all accessories including but not limited to hinges, latches, coat hooks, door bumpers, door pulls, fasteners, pilaster shoes, etc.
53. Furnish and install all bathroom accessories shown on drawings and in specifications. Including but not limited to grab bars, hooks, dispensers, hand dryers, mirrors, etc.
54. Furnish and install all fire extinguishers, fire protection cabinets, and accessories. Where extinguishers are located without cabinets, provide and install mounting brackets. Provide fire extinguisher indication signage for all fire extinguisher locations. Coordinate installation of signage with Whiting-Turner.

CASEWORK

55. Contractor to furnish and install all casework and accessories shown on drawings and in specifications. Including but not limited to: all laminate clad casework, filler panels, cabinets, reception desks, countertops, wall caps, shelving, particle board, decorative laminates, edge banding, stainless steel base and supports, and all accessories.
56. Provide and install all cabinet hardware, including but not limited to hinges, pulls, drawer slides, locks, keys, file suspension system, support brackets, shelving, cable grommets, etc.
57. Provide and install quartz wall cap and trim on knee wall. See drawing a1.2.
58. Furnish and install wood base trim at knee wall.
59. This contractor is responsible to verify dimensions for casework installation.

Temp Protection

1. Provide temp protection to avoid any damage to surrounding finish items.

Final Clean up

1. Perform daily clean up and final clean up of all work areas. Ensure no objects are left on the project.

WORK BY OTHERS

1. See other scopes

ALTERNATIVE PRICING:

Submit with your bid the following alternative pricing. Insert the costs/descriptions in the spaces provided on the bid forms.

Alternate No.1: Deduct the window walls shown.

Alternate No.2: Deduct new coffee bar area.

Alternate No.3: New AHU as shown.

Alternate No.4: Furnish and install new ACT ceilings in first floor bathrooms, using Ceramaguard moisture resistant tile.

ALLOWANCE PRICING:

Include in your base bid the following FULL allowance costs, including all supervision, overhead and profit, etc. Monies not used will be credited back at end of work:

Allowance No.1: none

UNIT PRICES: Please fill in all unit bid prices on the bid form except building concrete items. Unit prices will be used to adjust for additional work added or deducted during the course of the project.

END OF SECTION

BID PACKAGE #09B FLOORING

A. This Bid Package includes work for the District Office Renovations. The bidder must review all sets of bid documents and bid schedules.

B. The provisions outlined in the General Scope of Work shall apply to all items of this section.

C. The Scope of Work includes all labor, material, tools, equipment, storage, planning, coordination, engineering, unloading, supervision, and other items necessary to furnish and install Concrete materials as described and shown on the Contact Documents, including but not limited to the following:

Section: Description

Applicable specification sections: This work primarily includes but is not limited to the following specification sections as well as related work specified or shown elsewhere in the contract documents:

DIVISION 00 - CONTRACT REQUIREMENTS

Sections
In Its Entirety

DIVISION 1 – GENERAL REQUIREMENTS

Sections
In Its Entirety

DIVISION 09 – FINISHES

Sections
09 65 13 RESILIENT BASE AND ACCESSORIES
09 68 13 TILE CARPETING

SPECIFIC PERFORMANCE REQUIREMENTS ITEMS

1. This contractor is required to coordinate all your work with other trades as well as the Owner's direct hire trades.

SPECIFIC SCOPE ITEMS

The scope below has been separated into sub-sections for clarity but each line applies to this scope of work in its entirety (i.e. clean up is required for all activities). Furnish and install all required labor, equipment & materials to complete this project including, but not necessarily limited to, the following:

Specific Scope of Work: Flooring

1. Furnish and install all tile carpeting, LVT, and specified rubber base.
2. Furnish and install all transition strips and miscellaneous trim pieces where needed.
3. All seams must be inconspicuous, flat, unpuckered edges, and free from excess adhesive.
4. Include floor prep necessary on all the existing floors in order to create the proper sub floor according to the manufacture's recommendations for the new flooring. Prep to include scraping, disc sanding and flash patching as required, etc. Since this is an existing concrete floor project, assume that all floor areas will require flash patching. This is mandatory.
5. This subcontractor is responsible for hauling all of their materials to the work areas.
6. This contractor shall furnish and install the wall tile shown on the drawings and in the specifications. Reference casework drawings and toilet room drawings.
7. Provide attic stock if required.
8. Building heat is by others, but this contractor is responsible to supply a portable heater in the area they are working if temperature conditions are not adequate. Provide fans for your work.
9. Coordinate work with electrical, mechanical, and plumbing devices in the floor. Cut your flooring around these 100% neat and true. No exceptions.
10. Verify that air and surface temperature, moisture, & humidity conditions are suitable for installation of this work.

Temp Protection

1. Provide temp protection to avoid any damage to surrounding finish items.

Final Clean up

1. Perform daily and final clean up of all work areas. Ensure no objects are left on the project

WORK BY OTHERS

1. See other scopes

ALTERNATIVE PRICING:

Submit with your bid the following alternative pricing. Insert the costs/descriptions in the spaces provided on the bid forms.

Alternate No. 1 – Deduct the window walls shown.

Alternate No. 2 – Deduct the new coffee bar area.

Alternate No. 3 – none

Alternate No. 4– none

ALLOWANCE PRICING:

Include in your base bid the following FULL allowance costs, including all supervision, overhead and profit, etc. Monies not used will be credited back at end of work:

Allowance No.1: none

UNIT PRICES: Please fill in all unit bid prices on the bid form except building concrete items. Unit prices will be used to adjust for additional work added or deducted during the course of the project.

END OF SECTION

BID PACKAGE #09C PAINTING

A. This Bid Package includes work for the District Office Renovations. The bidder must review all sets of bid documents and bid schedules.

B. The provisions outlined in the General Scope of Work shall apply to all items of this section.

C. The Scope of Work includes all labor, material, tools, equipment, storage, planning, coordination, engineering, unloading, supervision, and other items necessary to furnish and install Concrete materials as described and shown on the Contact Documents, including but not limited to the following:

Section: Description

Applicable specification sections: This work primarily includes but is not limited to the following specification sections as well as related work specified or shown elsewhere in the contract documents:

DIVISION 00 - CONTRACT REQUIREMENTS

Sections
In Its Entirety

DIVISION 1 – GENERAL REQUIREMENTS

Sections
In Its Entirety

DIVISION 09 – FINISHES

09 91 23 INTERIOR PAINTING

SPECIFIC PERFORMANCE REQUIREMENTS ITEMS

1. This contractor is required to coordinate all your work with other trades as well as the Owner's direct hire trades.

SPECIFIC SCOPE ITEMS

The scope below has been separated into sub-sections for clarity but each line applies to this scope of work in its entirety (i.e. clean up is required for all activities). Furnish and install all required labor, equipment & materials to complete this project including, but not necessarily limited to, the following:

Specific Scope of Work: PAINTING

1. Include the cost of 8 man hours above and beyond your touch-up work that is included in this contract.

1. This work includes block filler, primers, paint, and high performance coatings (provide prep prior to installation as specified).
2. Perform surface prep as necessary on new and existing surfaces. This may include miscellaneous caulking, patching, sanding, scraping, or light cleaning or dusting. Scrape any loose paint prior to painting.
3. Paint all doors and frames in the new space.
4. Caulk in all interior doorframes to drywall, wood trim, etc. Putty all nail holes prior to painting. Also caulk all interior window frames to drywall.
5. Paint all drywall ceilings, bulkheads and soffits – review the reflected ceiling plans for locations of drywall ceilings.
6. Cover all floors while painting – this includes finished and unfinished floors. This contractor will be responsible to remove any overspray from the floors.
7. Perform exterior painting of wood, masonry, and metal items scheduled to receive paint.
8. Include priming of all surfaces prior to application of paint.
9. Provide minor prep work to wood trim and gypsum walls prior to installation. This is to include but is not limited to: sanding, scraping, puttying, dusting, etc.
10. Coordinate with the drywall contractor related to patching and prep for finishes. The painting contractor shall not proceed with final coats of paint until the drywall contractor has completed the touch up of any imperfections in his work.
11. Coordinate with the drywall contractor related to patching and prep for finishes as follows:
    a. Drywall subcontractor will complete final sanding of drywall and ceilings.
    b. Painting subcontractor to apply the prime coat
    c. Drywall and painting subcontractors to walk the entire area and review drywall quality. Imperfections will be identified and circled in pencil.
    d. Drywall contractor will repair all circled imperfections, walls and ceilings.
    e. Painter will spot prime repairs, walls and ceilings.
    f. Painter will proceed with application of the first coat.
    g. Painter will complete final coat by means of rolling and/or brushing over protected finished floors.
12. Full point up will take place prior to painting final coat of paint.
13. Final coat shall be painted after everything is installed, floors, ceilings, casework, etc.
14. Final coat of paint to be painted after wall base is installed.
15. Fire rating labels shall not be painted over.
16. Cleaning of overspray as required. Scrape paint off all glass surfaces and any finished product. Pay the cost to replace any item that cannot be cleaned back to its original condition.
17. Tape off finish products that may be installed prior to your painting.
18. Perform normal punch-list touch-ups at the end of the project prior to move-in. Protect the finished work by other trades.
19.

Temp Protection

1. Provide temp protection to avoid any damage to surrounding finish items.

Final Clean up

1. Perform daily and final clean up of all work areas. Ensure no objects are left on the project

WORK BY OTHERS

1. See other scopes

ALTERNATIVE PRICING:

Submit with your bid the following alternative pricing. Insert the costs/descriptions in the spaces provided on the bid forms.

Alternate No. 1 – Deduct the window walls shown.

Alternate No. 2 – Deduct the new coffee bar area.

ALLOWANCE PRICING:

Include in your base bid the following FULL allowance costs, including all supervision, overhead and profit, etc. Monies not used will be credited back at end of work:

Allowance No.1: none

UNIT PRICES: Please fill in all unit bid prices on the bid form except building concrete items. Unit prices will be used to adjust for additional work added or deducted during the course of the project.

END OF SECTION

BID PACKAGE #12A ROLLER SHADES

A. This Bid Package includes work for the District Office Renovations. The bidder must review all sets of bid documents and bid schedules.

B. The provisions outlined in the General Scope of Work shall apply to all items of this section.

C. The Scope of Work includes all labor, material, tools, equipment, storage, planning, coordination, engineering, unloading, supervision, and other items necessary to furnish and install Concrete materials as described and shown on the Contact Documents, including but not limited to the following:

Section: Description

Applicable specification sections: This work primarily includes but is not limited to the following specification sections as well as related work specified or shown elsewhere in the contract documents:

DIVISION 00 - CONTRACT REQUIREMENTS

Sections
In Its Entirety

DIVISION 1 – GENERAL REQUIREMENTS

Sections
In Its Entirety

DIVISION 12 – FURNISHINGS

12 24 13 ROLLER SHADES

SPECIFIC PERFORMANCE REQUIREMENTS ITEMS

1. This contractor is required to coordinate all your work with other trades as well as the Owner's direct hire trades.

SPECIFIC SCOPE ITEMS

The scope below has been separated into sub-sections for clarity but each line applies to this scope of work in its entirety (i.e. clean up is required for all activities). Furnish and install all required labor, equipment & materials to complete this project including, but not necessarily limited to, the following:

Specific Scope of Work: ROLLER SHADES

1. Provide and install roller shades system shown on drawings and in specifications.
2. Reference drawing a1.1c.

3. Provide blocking shop drawings for shade installation. Provide all applicable product data for shades and accessories.

Temp Protection

1. Provide temp protection to avoid any damage to surrounding finish items

Final Clean up

1. Perform daily and final clean up of all work areas. Ensure no objects are left on the project

WORK BY OTHERS

1. In wall blocking for shades to be provided by others.

ALTERNATIVE PRICING:

Submit with your bid the following alternative pricing. Insert the costs/descriptions in the spaces provided on the bid forms.

Alternate No. 1 – Deduct the window walls shown.

Alternate No. 2 – none

Alternate No. 3 – none

ALLOWANCE PRICING:

Include in your base bid the following FULL allowance costs, including all supervision, overhead and profit, etc. Monies not used will be credited back at end of work:

Allowance No.1: none

UNIT PRICES: Please fill in all unit bid prices on the bid form except building concrete items. Unit prices will be used to adjust for additional work added or deducted during the course of the project.

END OF SECTION

BID PACKAGE #23A PLUMBING, HVAC, Controls

A. This Bid Package includes work for the District Office Renovations. The bidder must review all sets of bid documents and bid schedules.

B. The provisions outlined in the General Scope of Work shall apply to all items of this section.

C. The Scope of Work includes all labor, material, tools, equipment, storage, planning, coordination, engineering, unloading, supervision, and other items necessary to furnish and install Concrete materials as described and shown on the Contact Documents, including but not limited to the following:

Section: Description

Applicable specification sections: This work primarily includes but is not limited to the following specification sections as well as related work specified or shown elsewhere in the contract documents:

DIVISION 00 - CONTRACT REQUIREMENTS

Sections
In Its Entirety

DIVISION 1 – GENERAL REQUIREMENTS

Sections
In Its Entirety

DIVISION 22 – PLUMBING

Sections
In Its Entirety

DIVISION 23 – HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)

Sections
In Its Entirety

DIVISION 26 – ELECTRICAL

Sections
In Its Entirety for Coordination for Any Power requirements or Control work & Raceways

SPECIFIC PERFORMANCE REQUIREMENTS ITEMS

1. The CM is to procure and pay for the Building Permit. You will procure the Plumbing and HVAC permits if required for this work.
2. This contractor is required to coordinate all your work with other trades as well as the Owner's direct hire trades. You are a prime contractor (along with HVAC + Electrical) and will be responsible to move all trades along to timely completion

3. The Building is occupied. Your work must NOT shut down active services.

SPECIFIC SCOPE ITEMS

The scope below has been separated into sub-sections for clarity but each line applies to this scope of work in its entirety (i.e. clean up is required for all activities). Furnish and install all required labor, equipment & materials to complete this project including, but not necessarily limited to, the following:

Specific Scope of Work: PLUMBING

1. Perform all Plumbing demolition as a 'cut and drop' type operation.
    a. Shut down at nearest valves, drain, cut & cap plumbing lines shown on drawings.
    b. Demo all fixtures, pipe, hangers, insulation to the floor.
    c. Demo contractor will clean up all debris to their dumpster
    d. You own salvage to any metals
2. Drain and re-charge the system for your work. Coordinate times, etc. Pressure test the new work, re-fill and verify the system and fixtures are performing correctly.
3. For any hot work that is required, such as brazing or welding, proper notice must be given to WT so that a "hot work" permit can be issued.
4. Obtain all necessary permits, fees, and inspections, the building permit is by the CM.
5. Provide all cutting, core drilling, and sleeve work, necessary to install all pipe, ductwork and plumbing work detailed on the drawings. Provide fireproofing of all penetrations in walls, ceilings or floors. Sleeve all pipes. Perform any cutting early in the project.
6. Include all piping, valves, fittings, fixtures, venting, switches, hangers, anchors, supports, manifolds, control panels, outlets, boxes, pumps, receivers, ejectors, and other specialties and accessories.
7. Any "late" penetrations through walls that have already been patched and/or finished will be the responsibility of this contractor to repair.
8. Caulk Seal all joints where plumbing fixtures abut walls
9. Testing, sanitation, certification of plumbing system
10. Coordinate location of all materials/equipment above ceilings with other trades. Any conflicts must be resolved prior to fabrication. Install all duct and pipe as close to the existing structure above as possible.
11. For all under slab piping: Layout by this contractor, saw cutting and breaking is by Demo sub. Digging, backfill, spoil removal by this contractor. You arrange and pay for the concrete to be replaced.
12. Flush all new piping and equipment. Prior to your new pipe work, verify with Owner's shops the condition of existing water, strainers, etc, to avoid flushing issues later on.
13. Sterilize all domestic work.

HVAC Work

1. Perform all HVAC demolition as a 'cut and drop' type operation.
    a. Shut down the HVAC equipment, cut & cap all ducts shown on drawings.
    b. All shutdowns must be coordinated in advance with Owner.
    c. Demo all grilles, registers, diffusers, hangers, insulation to the floor.
    d. Demo contractor will clean up all debris to their dumpster

2. For the large HVAC equipment, demolition as follows:
    a. Evacuate any coolants
    b. Remove and dispose in the demolition supplied dumpster
1. Provide all cutting, core drilling, and sleeve work, necessary to install all pipe, and ductwork detailed on the drawings.
2. Provide fireproofing of all penetrations in walls, ceilings or floors. Sleeve all pipes. Perform any cutting early in the project.
3. Furnish and install all necessary items to complete the new HVAC systems. Provide ductwork, filters, access doors, fire dampers, piping, equipment, fans, testing and balancing, grilles, registers, diffusers, identification devices, labels and tags, insulation, and any other item necessary to complete the work. Duct offsets required due to the existing structure must be included.
4. All Insulation for plumbing, pipe, duct and equipment. Insulate pipe, valves, and pumps, etc, 100%.
5. Furnish only any access panels not shown on A-drawings you need for mechanical and plumbing valves, to be installed by the drywall contractor.
6. Coordinate location of all equipment and materials above the ceilings with your work. Any conflicts must be resolved prior to the start of work. Lights have precedence over ductwork or registers.
7. Review equipment suppliers " recommended installation procedures" to assure that design complies with manufacturer's space clearances and clearances established by local authorities for maintenance and service
8. Provide vibration isolation devices for all equipment as required.
9. HVAC piping, valves, and water piping must be labeled.
10. Install ductwork, leak test and insulate, at a speed that allows other trades to keep their work on schedule.
11. Balancing and the balancing reports must be completed promptly as they are necessary for the successful completion of the space. Reports must be completed two weeks prior to start of commissioning and / or occupancy.
12. ATC control work is part of your bid. Review the control scope of work shown and required.
13. Demonstrate and Train owner on all equipment and devices installed under the contract. Videotape training session and turn over to the owner.

Temp Protection

1. Provide temp protection to avoid any damage to surrounding finish items.

Final Clean up

1. Perform daily and final clean up of all work areas. Ensure no objects are left on the project

WORK BY OTHERS

1. See items above to be done by Demo sub

ALTERNATIVE PRICING:

Submit with your bid the following alternative pricing. Insert the costs/descriptions in the spaces provided on the bid forms.

Alternate No. 1 - N/A

Alternate No. 2 – Deduct The new coffee bar area.

Alternate No. 3 – New AHU as shown. Include costs to haul off all equipment and debris 100%. Include any and all re-balance work as well as control work necessary for proper operation.

ALLOWANCE PRICING:

Include in your base bid the following FULL allowance costs, including all supervision, overhead and profit, etc. Monies not used will be credited back at end of work:

Allowance No.1: include $5,000, to be used T&M for misc work.

UNIT PRICES: Please fill in all unit bid prices on the bid form except building concrete items. Unit prices will be used to adjust for additional work added or deducted during the course of the project.

END OF SECTION

BID PACKAGE #26A ELECTRICAL

A. This Bid Package includes work for the District Office Renovations. The bidder must review all sets of bid documents and bid schedules.

B. The provisions outlined in the General Scope of Work shall apply to all items of this section.

C. The Scope of Work includes all labor, material, tools, equipment, storage, planning, coordination, engineering, unloading, supervision, and other items necessary to furnish and install Concrete materials as described and shown on the Contact Documents, including but not limited to the following:

Section: Description

Applicable specification sections: This work primarily includes but is not limited to the following specification sections as well as related work specified or shown elsewhere in the contract documents:

DIVISION 00 - CONTRACT REQUIREMENTS
Sections
In Its Entirety

DIVISION 1 – GENERAL REQUIREMENTS
Sections
In Its Entirety

DIVISION 23 – HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)
Sections
In Its Entirety for Coordination for Power requirements

DIVISION 26 – ELECTRICAL
Sections
In Its Entirety

SPECIFIC PERFORMANCE REQUIREMENTS ITEMS

1. The CM is to procure and pay for the Building Permit. You will procure the Electrical and FA permits if required for this work.
2. This contractor is required to coordinate all your work with other trades as well as the Owner's direct hire trades. You are a prime contractor (along with HVAC) and will be responsible to move all trades along to timely completion
3. The Building is occupied. Your work must NOT shut down active services.

SPECIFIC SCOPE ITEMS

The scope below has been separated into sub-sections for clarity but each line applies to this scope of work in its entirety (i.e. clean up is required for all activities). Furnish and install all required labor, equipment & materials to complete this project including, but not necessarily limited to, the following:

Specific Scope of Work: ELECTRICAL

Temp power and Lighting

1. This contractor will provide temporary power and lighting in all rooms being renovated Remove temporary promptly as permanent power and lighting is activated. Use of the existing receptacles for temp power is preferred, but you must keep power live for other trades during your work, safely.
2. All temporary power to be in accordance with OSHA requirements (ground fault breakers are required) and to be placed so that no extension cord greater than 50 ft. will be required
3. Temp power must be at both floor levels.
4. Temporary lighting to be installed in accordance with anticipated partition layout to provide per OSHA requirements, but not less than 2 foot-candles @ any location in the building. If possible, also maintain during construction power to all exterior lights.

Electrical work

1. Perform all Electrical demolition as a 'cut and drop' type operation.
    a. Shut down at nearest panel shown on drawings. Lock out / tag out, etc, to safely perform all removal work
    b. Demo all fixtures, raceways, conductors, boxes, hangers, fasteners to the floor.
    c. Demo contractor will clean up all debris to their dumpster
    d. You own salvage to any wire or metals
2. Furnish and install all new panels and breakers as shown on the drawings.
3. Supply and Install new receptacles, cover plates, Supply GFI receptacles where required.
4. Supply and install all new light fixtures as shown on the drawings. Attach to structure above per the details. Install emergency lighting per local code.
5. Provide all cutting, core drilling, saw cutting, sleeving, and fire-stopping necessary for the installation of all new work. Perform any / all cutting early in the project.
6. Any "late" penetrations through walls that have already been patched and/or finished will be the responsibility of this contractor to repair.
7. Provide all labels and tags on devices, receptacles, junction boxes, and panels as required, including revising panel schedules as necessary. Color code J-boxes as required.
8. Coordinate location of all materials and equipment above the ceilings with other trades. Any conflicts must be resolved prior to starting work. Ductwork has precedence over conduit. Coordinate J-box locations with other trades so they are not blocked.
9. Furnish and install disconnects for all new mechanical equipment. Furnish and install equipment connection for HVAC
10. Fire Alarm work is by this Contractor
11. Furnish and install 120V power to any VAV's or HVAC Equipment or control panels shown on the mechanical drawings. This includes any control panels.

12. Review the mechanical, and control equipment submittals. Report any wiring/power discrepancies to WT prior to installing the work.
13. Furnish and install all grounding systems as specified or shown.
14. Furnish access panels required in walls and ceilings if you need them. Installed by others.
15. Provide all fire stopping around all conduit penetrations in walls, floors, and ceilings. Tele/Comm contractor owns fire sealing his conduit once cables are pulled (in your price).
16. Coordinate location of all materials and equipment above the ceilings with your pipe. Any conflicts must be resolved prior to starting work. Ductwork and lights have precedence.
17. Provide as-builts per the specifications.
18. Forward testing and certification documentation to W-T.
19. Perform a pre-test of all systems prior to the Fire Marshall inspection, then the full FM final inspection / demonstration.
1. Demonstrate and Train owner on all equipment and devices installed under the contract.

Tele Data work

1. The 26A Electrical Contractor will provide raceways IN ALL NEW WALLS only. You modify or install any surface mounted raceways on the existing walls.
2. Install all boxes, conductors, jacks, labels, punch down, testing, etc, to provide a fully functional IT system in all new renovated rooms.
3. Verify any outlets and conductors being re-used are fully functional.
4. Remove any outlets and conductors NOT being re-used in all new renovated rooms.
5. Remove all old IT wires from the outlet back to the punch down block 100%. Remove all un-used devices in the IT closet that served the renovated space. The balance of the building is occupied so this must be done with extreme care.

Fire Alarm work

1. Modify the building fire alarm devices and system including all wiring, conduit, devices, testing, connections to equipment, etc. for the new rooms, ceilings and wall layout. Comply with local and national codes.
2. Coordinate and provide HVAC for duct smoke detectors.
3. Provide labor, standby mechanics, and equipment for all testing and startup (fire alarm, etc.).

Temp Protection

1. Provide temp protection to avoid any damage to surrounding finish items

Final Clean up

1. Perform daily and final clean up of all work areas. Ensure no objects are left on the project.

WORK BY OTHERS

1. ATC control work is by 23B Contractor.
2. See items above to be done by Demo sub

ALTERNATIVE PRICING:

Submit with your bid the following alternative pricing. Insert the costs/descriptions in the spaces provided on the bid forms.

Alternate No. 1 – Deduct the lighting shown in window wall area as shown.

Alternate No. 2 – Deduct The new coffee bar area.

Alternate No. 3 – New AHU as shown.

Alternate No. 4 – Tie up existing lights in 1st floor bathrooms during demo of ceilings. New ACT ceilings to be provided and lights reinstalled once demo is complete.

ALLOWANCE PRICING:

Include in your base bid the following FULL allowance costs, including all supervision, overhead and profit, etc. Monies not used will be credited back at end of work:

Allowance No.1: include $5,000, to be used T&M for misc work.

UNIT PRICES: Please fill in all unit bid prices on the bid form except building concrete items. Unit prices will be used to adjust for additional work added or deducted during the course of the project.

END OF SECTION

SECTION 01 21 00

ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
2. Any unused monies of the allowance shall be returned to the owner via a credit change order at the end of the project, and will be reflected in the final application for payment.

B. Types of allowances include the following:

1. Lump-sum allowances.

C. Related Sections include the following:

1. Division 01 Section 01 26 00 "Contract Modification Procedures" for procedures for submitting and handling Change Orders for allowances.
2. Division 01 Section 01 40 00 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.
3. Divisions 02 through 49 Sections for items of Work covered by allowances.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.4 SUBMITTALS

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

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

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

1.6 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner under allowance and shall include taxes, freight, and delivery to Project site.

B. Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

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

B. If all or part of the “Allowance” is used, the Allowance Authorization form must be fully executed and authorized. It can be found at section 00 63 73-1.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Includes an allowance entitled "General Owner's Allowance", in the amount of **$40,000.** This allowance will be utilized by the owner for owner-elected changes to the work. Any or all unused allowance monies shall be returned to the owner via a credit change order at the end of the project. This allowance shall be carried as an individual line-item on the Applications for Payment.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 21 16

ALLOWANCE AUTHORIZATION FORM

Project: Appoquinimink School District
Olive B. Loss Elementary School Chiller Replacement
200 Brennan Blvd.
Bear, Delaware 19701

Architect: R G Architects, LLC

Project No.:

Contractor:

AAA No.: **Initiation Date:**

The Allowance is allocated as follows:

Total original Contract Allowance was:	$
Amount of Contract Allowance Access previously authorized:	$
Adjusted Contract Allowance prior to this authorization is:	$
The amount of available Allowance will Decrease by this Access Authorization:	$
The remaining Contract Allowance, after this Access Authorization will be:	$

Recommended by:
Architect

By (Signature): _____
Date: _____

Accepted by:
Contractor

By (Signature): _____
Date: _____

Approved by:
Owner

By (Signature): _____
Date: _____

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 23 00 - ALTERNATES

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 alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
   1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
   2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

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

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

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

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate. Refer to the Alternates Key Plans for additional information.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

TBD

END OF SECTION

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Requests for substitution must be made ten days prior to bid. This specification section applies to extra-ordinary conditions that could not be requested during the bidding period.

B. 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. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract, but no later than 60 days after commencement of the Work.

B. Related Sections: The following Divisions contain requirements that relate to this Section:

1. Division 01 Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.
2. Division 01 Section 01 40 00 “Quality Requirements” specifies requirements governing the Contractor's selection of products and product options.

1.3 DEFINITIONS

A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.

B. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:

1. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
2. Revisions to the Contract Documents requested by the Owner or Architect.
3. Specified options of products and construction methods included in the Contract Documents.
4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS

A. Substitution Request Submittal: The Architect will consider requests for substitution if received within 60 days after commencement of the Work (Item 1.1, A. above). Requests received more

than 60 days after commencement of the Work may be considered or rejected at the discretion of the Architect.

1. Submit three copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for change-order proposals. The Contractor is solely responsible for obtaining the required forms to submit before the stated time period expires.
2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.
3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
    a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors that will be necessary to accommodate the proposed substitution.
    b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.
    c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
    d. Samples, where applicable or requested.
    e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
    f. Cost information, including a proposal of the net change, if any in the Contract Sum.
    g. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.
    h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
4. Architect's Action: If necessary, the Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. The Architect will notify the Contractor of acceptance or rejection of the substitution within two weeks of receipt of the request, or one week of receipt of additional information or documentation, whichever is later.
    a. Use the product specified if the Architect cannot make a decision on the use of a proposed substitute within the time allocated.

PART 2 - PRODUCTS

1.5 SUBSTITUTIONS

A. Conditions: The Architect will receive and consider the Contractor's request for substitution when the following conditions are satisfied, as determined by the Architect. If the following conditions are not satisfied, the Architect will return the requests without action except to record noncompliance with these requirements.
    1. Revisions to the Contract Documents are not required.
    2. Proposed changes are in keeping with the general intent of the Contract Documents.
    3. The request is timely, fully documented, and properly submitted.

4. The specified product or method of construction cannot be provided within the Contract Time. The Architect will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
5. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.
6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
7. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
8. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.

B. The Contractor's submittal and the Architect's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

PART 3 - EXECUTION (Not Used)

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 26 00

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

B. Related Sections include the following:

1. Division 01 Section 01 60 00 "Product Requirements" for administrative procedures for handling requests for substitutions made after 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."

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request, but no more than 20 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.
    d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish

times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, 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 Division 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

1.5 CHANGE ORDER PROCEDURES

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

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 26 50

CHANGE ORDER REQUEST SUBMISSION FORMAT

The following is a general listing of requirements relating to change order work. Refer to the Contract, General Conditions, Supplementary Conditions, General Scope, and Specification for full requirements.

1. Refer to the Supplementary General Conditions for the Allowable overhead and profit Mark-ups.

2. Any proposed change order / request for the project must be submitted in the format example shown in this specification section.

3. All labor and material costs must be separated with their applicable mark-ups detailed.

4. Whiting-Turner, the Owner, or the Architect may request additional breakdown information, back-up, etc., at their discretion at any time.

5. Each price submitted must include the following:
    a. Detailed description of the issue.
    b. Location in the building.
    c. Reason why it's extra
    d. Drawing, Specification or other documentation references.
    e. RFI reference
    f. Submittal reference
    g. WT price request reference

6. For price requests or time and material work, obtain approval from the Whiting-Turner project manager in writing prior to proceeding with the extra work.

7. Notify Whiting-Turner in writing immediately (with 24 hours) upon discovering an extra work issue.

8. Any work authorized to proceed on a time and material basis must have the T+M tickets signed daily by Whiting-Turner.

9. Extra work prices or unsigned T+M tickets forwarded after the work is completed will not be accepted.

10. For emergency work that may impact the schedule, verbal cost budgets must be submitted immediately. The work may be authorized to proceed at the Whiting-Turner project manager's and/or owner's discretion.

11. Return extra work price requests in 5 days. Finalize T+M tickets in 5 days.

12. Any item of extra work that cannot be agreed upon at a fixed price will be performed on a time and material basis that is not to exceed an agreed upon budget.

Labor Bill Rates & Change Request Submission Formats

A. Labor Billing Rate Calculation – Example

Base Rate	$17.40
Fringe Benefits *@% of base rate	8.53
Subtotal Rate	$25.93
Insurance& taxes ** @% of subtotal rate	9.07
Subtotal - **Labor Rate**	**$35.00**
Overhead & Profit @ 15%***	5.25
Total – **Hourly Billing Rate**	$40.25

NOTE:

* The fringe benefit includes health, welfare or retirement benefits, vacation, holiday or sick leave pay.

** The insurance and taxes include employer payment for unemployment insurance, worker's compensation, FICA, Bonds, Gross Receipts, etc.

*** Allowable mark-up will decrease on a scale based on the total amount of the proposed change. Refer to the supplementary general conditions for additional information. This note is typical for all of the examples above and below.

B. Change Directive Calculation

1. Trade Contractor

Labor Billing Rate$35/hr x 50 hrs	$1,750.00
Fee (overhead & profit) @15%***	262.50
Subtotal Labor	$2,012.50
Material or Equipment	$2,000.00
Fee (overhead & profit) @15%***	300.00
Subtotal Material	$2,300.00
Total Costs	**$4,312.50**

2. Subcontractor / Trade Contractor

Sub- Labor Billing Rate $35/hr x 50hrs	$1,750.00
Fee (sub overhead & profit) @15%***	265.50
Subtotal-Labor	$2,012.50
Sub-Material or Equipment	$2,000.00
Fee (sub overhead & profit) @15%***	300.00
Subtotal-Material	$2,300.00
Total Costs-Subcontractor	**$4,312.50**
Fee payable to contractor	
Subcontractor Labor and Material	$4,312.50
Contractor overhead & profit @ 5%	215.62
Total Costs	**$4,528.12**

3. Sub-Subcontractor / Subcontractor / Trade Contractor

Sub-subcon. Labor Billing Rate $35/hr x 50hrs	$1,750.00
Fee (overhead & profit) @15%***	262.50
Subtotal- Labor	$2,012.50
Sub-subcon. Material or Equipment	$2,000.00
Fee (overhead & profit) @15%***	300.00
Subtotal-Material	$2,300.00
Total Costs – Sub-subcontractor	**$4,312.50**
Fee payable to Sub-Contractor	
Sub-subcontractor Labor and Material	$4,312.50
Subcontractor overhead & profit @5%	215.63
Total Costs – Subcontractor	**$4,528.13**
Fee payable to Trade Contractor	
Subcontractor Labor and Material	$4,528.13
Contractor overhead & profit @5%	226.41
Total Costs	**$4,754.54**

END OF SECTION

SECTION 01 29 00

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

B. Related Sections include the following:

1. Division 01 Section 01 26 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
2. Division 01 Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with Continuation Sheets.
b. Submittals Schedule.
c. 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.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of Architect.

c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Submit draft of AIA Document G703 Continuation Sheets.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate. Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training in the amount of 5 percent of the Contract Sum.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

    a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.

6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. 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.

8. 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. Include each Change Order as a new line item on the Schedule of Values.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Submit 2 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Products list.
5. Schedule of unit prices.
6. Submittals Schedule (preliminary if not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
9. Copies of building permits.
10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
11. Initial progress report.
12. Report of preconstruction conference.
13. Certificates of insurance and insurance policies.
14. Performance and payment bonds.
15. Data needed to acquire Owner's insurance.
16. Initial settlement survey and damage report if required.

H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for 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 Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.
B. Electronic document submittal service.
C. Submittals for review, information, and project closeout.
D. Number of copies of submittals.
E. Requests for Interpretation (RFI) procedures.
F. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 60 00 - Product Requirements: General product requirements.
B. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.
C. Section 01 77 50-Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

1.04 PROJECT COORDINATOR

A. Project Coordinator: Construction Manager.
B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for site access, traffic, and parking facilities.
C. During construction, coordinate use of site and facilities through the Project Coordinator.
D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 10 00 - Summary.
F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
G. Make the following types of submittals to Architect through the Project Coordinator:
    1. Requests for Information.
    2. Shop drawings, product data, and samples.
    3. Test and inspection reports.
    4. Design data.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.

1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
2. Contractor and Architect are required to use this service.
3. It is Contractor's responsibility to submit documents in allowable format.
4. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no extra charge.
5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
7. All other specified submittal and document transmission procedures apply, exceptthat electronic document requirements do not apply to samples or color selection charts.

3.02 REQUESTS FOR INFORMATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
      a. Review, coordinate, and comment on requests originating with subcontractorsand/or materials suppliers.
      b. Do not forward requests which solely require internal coordination between subcontractors.
   2. Prepare using software provided by the Electronic Document Submittal Service.
   3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
   2. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
      a. Approval of submittals (use procedures specified elsewhere in this section).
      b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
      c. Changes that entail change in Contract Time and Contract Sum (complywith provisions of the Conditions of the Contract).
      d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
   3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They willbe

returned without a response, with an explanatory notation.

4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.

E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
   1. Official Project name and number, and any additional required identifiers established in Contract Documents.
   2. Owner's, Architect's, and Contractor's names.
   3. Discrete and consecutive RFI number, and descriptive subject/title.
   4. Issue date, and requested reply date.
   5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
   6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
   7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

G. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
   1. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.

3.03 SUBMITTAL SCHEDULE

A. Submit to Architect for review a schedule for submittals in tabular format.
   1. Submit at the same time as the preliminary schedule.
   2. Format schedule to allow tracking of status of submittals throughout duration of construction.
   3. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
   4. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
      a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.04 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.
D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.05 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.
B. Submit for Architect's knowledge as contract administrator or for Owner.

3.06 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.
B. Submit Final Correction Punch List for Substantial Completion.
C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.
D. Submit for Owner's benefit during and after project completion.

3.07 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.08 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a separate transmittal for each item.
   2. Transmit using approved form.
   3. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   4. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   5. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
      a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
   6. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.

a. Upload submittals in electronic form to Electronic Document Submittal Service website.

7. Schedule submittals to expedite the Project, and coordinate submission of related items.
8. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
9. Provide space for Contractor and Architect review stamps.
10. When revised for resubmission, identify all changes made since previous submission.
11. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
12. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
13. Submittals not requested will be recognized, and will be returned "Not Reviewed",

B. Product Data Procedures:
1. Submit only information required by individual specification sections.
2. Collect required information into a single submittal.
3. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
2. Do not reproduce Contract Documents to create shop drawings.
3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.09 SUBMITTAL REVIEW

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

D. Architect's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
a. "Approved", or language with same legal meaning.
b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
1) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
2. Not Authorizing fabrication, delivery, and installation:
a. "Revise and Resubmit".
1) Resubmit revised item, with review notations acknowledged and incorporated.
b. "Rejected".
1) Submit item complying with requirements of Contract Documents.

E. Architect's and consultants' actions on items submitted for information:
1. Items for which no action was taken:

a. "Received" - to notify the Contractor that the submittal has been received for record only.

2. Items for which action was taken:
   a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

SECTION 01 31 00

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. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Project meetings.
2. Requests for Interpretation (RFIs).

B. Related Sections include the following:

1. Division 01 Section 01 32 00 "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
2. Division 01 Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Division 01 Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 COORDINATION

A. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

1.4 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

B. Preconstruction Conference: Schedule 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. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Tentative construction schedule.
b. Critical work sequencing and long-lead items.
c. Designation of key personnel and their duties.
d. Procedures for processing field decisions and Change Orders.
e. Procedures for RFIs.
f. Procedures for testing and inspecting.
g. Procedures for processing Applications for Payment.
h. Distribution of the Contract Documents.
i. Submittal procedures.
j. Preparation of Record Documents.
k. Use of the premises.
l. Work restrictions.
m. Owner's occupancy requirements.
n. Responsibility for temporary facilities and controls.
o. Construction waste management and recycling.
p. Parking availability.
q. Office, work, and storage areas.
r. Equipment deliveries and priorities.
s. First aid.
t. Security.
u. Progress cleaning.
v. Working hours.

3. Minutes: Architect will record and distribute meeting minutes.

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

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.

D. Progress Meetings: Conduct progress meetings at biweekly intervals.

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 conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. 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) Status of submittals.
        3) Deliveries.
        4) Quality and work standards.
        5) Status of correction of deficient items.
        6) Field observations.
        7) Request for Interpretations (RFIs).
        8) Status of proposal requests.

3. Minutes: Architect will record and distribute to Contractor the meeting minutes.

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

1. Attendees: Each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference 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.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.5 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure: Upon discovery of the need for interpretation of the Contract Documents, prepare and submit an RFI form. Oral RFIs will not be accepted.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
2. RFIs shall only be submitted to seek clarification or interpretation of ambiguities, conflicts, discrepancies, errors, inconsistencies, or omissions in the Contract Documents.
3. RFIs shall not take the place of Contractor figuring out information available in the Contract Documents.
4. Each RFI shall be limited to a single issue or very closely related issue.
5. Coordinate and promptly submit RFIs to avoid delays in Contractor's work and work of subcontractors.
6. Reviews/responses to RFIs shall not constitute an approval or direction related to Contractor's construction means, methods, procedures, sequences, or techniques.
7. Reviews/Responses to RFIs shall not constitute an approval or direction related to construction site safety.

B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:

1. Project name.
2. Date.
3. Name of Contractor.
4. Name of Architect.
5. RFI number, numbered sequentially.
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
10. Contractor's signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

    a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

C. Architect's Action: Architect will review each RFI, determine response required, and return it within **seven** working days. RFIs received after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:

    a. Requests for approval of substitutions.
    b. Requests for adjustments in the Contract Time or the Contract Sum.
    c. Requests for approval of submittals.
    d. Request for information already indicated on the Contract Documents.
    e. Requests for interpretation of Architect's actions on submittals.
    f. Incomplete RFIs or RFIs with numerous errors.

2. RFI response may include a request for additional information, in which case Architect's time for response will start again.

3. RFI response that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
4. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 7 calendar days of receipt of the RFI response.

D. 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.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly to the Architect.

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 32 00

CONSTRUCTION PROGRESS 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. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
3. Submittals Schedule.
4. Daily construction reports.
5. Material location reports.
6. Field condition reports.
7. Special reports.

B. Related Sections include the following:

1. Division 01 Section 01 29 00 "Payment Procedures" for submitting the Schedule of Values.
2. Division 01 Section 01 31 00 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
3. Division 01 Section 01 33 00 "Submittal Procedures" for submitting schedules and reports.
4. Division 01 Section 01 40 00 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.

1. Float time **belongs to Owner**.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

H. Major Area: A story of construction, a separate building, or a similar significant construction element.

I. Milestone: A key or critical point in time for reference or measurement.

J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

A. Qualification Data: For scheduling consultant.

B. Submittals Schedule: Submit two copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's final release or approval.

C. Preliminary Construction Schedule: Submit **two** opaque copies.

1. Approval of cost-loaded preliminary construction schedule will not constitute approval of Schedule of Values for cost-loaded activities.

1.5 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

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

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established for **commencement of the Work** to date of **Final** Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than **20** days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

5. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

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

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

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 10 days of date established for **the Notice of Award**. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At two week intervals, update schedule to reflect actual construction progress and activities. Issue schedule **one day** before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 32 10 – CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.1 Construction Schedule

1. The following Schedule is applicable to all bidders. The durations in the schedule are based on 5 day work weeks.
2. The Construction Schedule as approved by the Construction Manager and Owner will be an integral part of the Contract, and will establish interim work completion dates for the various activities.
3. The Construction Schedule may vary in accordance with construction conditions. Each Trade Contractor shall delay or expedite material and equipment deliveries, and modify the required labor forces to accommodate these varying conditions.
4. Work is to commence upon receipt of the Letter of Authorization to proceed.
5. Within fifteen (15) days after receipt of a "Letter of Authorization to proceed", each trade Contractor shall submit a detailed preliminary Construction Schedule to the Construction Manager. The schedule will include breakdowns of total man days of field labor into major categories of work, time estimates of various categories of work, and the crew size for each category.
6. Each Trade Contractor shall organize his Construction Schedule per Phase, Building, Area, and/or Floor as required by the Construction Manager.
7. Each Trade Contractor shall be responsible for participating in pull-planning sessions with WT
8. The Construction Manager shall schedule a meeting with the Trade Contractor to receive the contents of each Trade Contractor's preliminary Construction Schedule, coordinate the sequence of work, and make all revisions required. The Construction Manager shall have the final authority concerning the sequence of work and durations of each activity. Each Trade Contractor shall revise his schedule in accordance with that meeting and submit his schedule to the Construction Manager for approval. The Construction Manager will then develop the Project Construction Schedule. Each Trade Contractor shall schedule and perform his work in accordance with the Construction Manager's Project Construction Schedule.
9. The Schedule shall be the basis for the dates to start and complete work for various portions of each contract, and to complete work (including changes) for the Project. It shall be the duty of the Trade Contractor to conform to the approved Schedule and to arrange his work in such a manner that it will be installed in accordance with the Schedule.
10. Each Trade Contractor shall submit two (2) copies of an updated Construction Schedule comparing the original schedule to actual work in progress and projected work along with the preliminary application for payment.
11. A representative of each Trade Contractor shall meet with the Construction Manager and furnish to him information necessary for such re-evaluating and updating and, if applicable, information with regard to changes in the work and the Trade Contractor's proposed effort to overcome any delays incurred.
12. Should any work not be started or completed within five (5) days of the stated scheduled date, the Construction Manger shall have the right to order the Trade Contractor to expedite start and completion of the work by whatever means the Construction Manager deems appropriate and necessary, without additional compensation to the Trade Contractor.
13. Should any work fall to ten (10) or more days behind schedule, the Construction Manger shall have the right to perform the work or have the work performed by whatever method the Construction Manager deem appropriate.

14. Costs incurred by the Construction Manager in connection with "maintaining the Construction Schedule" under this section shall be reimbursed to the Construction Manager by the Trade Contractor.
15. It is expressly understood and agreed that failure by the Construction Manager to exercise the option to either order the Trade Contractor to expedite work, or to expedite the work by other means, shall not be considered precedent-setting for any other activities.
16. The following Construction Schedule is critical to the successful completion of the Project and is an integral portion of the Construction Documents. The Construction Schedule may vary in accordance with the construction conditions. The Trade Contractor shall delay or expedite his material and equipment deliveries and modify the required work forces to accommodate these varying conditions. The attached schedule is a milestone schedule with durations that portions of the project must be completed in. A more detailed construction schedule will be generated after all contracts have been awarded. By submitting a bid, each Trade Contractor is acknowledging that they can complete this work within the durations outlined in the milestone schedule.
17. The schedule is of the essence on this project and each contractor is responsible for completion of its work in coordination with the work of all other contractors within the required sequence and time frame so that the established schedule is met. Each contractor agrees to provide sufficient labor crew size, equipment and/or work overtime, weekends, or shiftwork as necessary to meet the activity durations on this schedule.
18. The attached schedule includes "estimated" start dates for the construction activities. In the interest of the overall project, W-T reserves the right to alter the sequencing of activities in order to accommodate project conditions and/or Owner requirements. It is understood that the contractor shall be obligated to complete its activities within the specified duration regardless of the actual start date.
19. All submittals and shop drawings must be submitted within a minimum of **two (2) weeks** of the notice to proceed with this subcontract, or the dates indicated on the schedule or scope of work, whichever occurs first. All expediting of materials and equipment to meet this schedule is the responsibility of the contractor. Contractor to pay for any quick ship charges if necessary.
20. All work, or applicable portions of the work, shall be sufficiently complete for Owner's use and occupancy and all required approvals and permits for use and occupancy shall have been issued by the appropriate authorities by the established "Date of Substantial Completion" of the work, or applicable portion thereof.
21. All punchlist work and project closeout documentation shall be completed and approved by the Owner and Architect by the "Date of Final Completion": which shall be no later than 21 days after the Date of Substantial Completion. Any uncompleted punchlist items after this date will be completed by Whiting-Turner and backcharged to the appropriate contractor or vendor. Final invoices will not be processed until final completion of the work and certification of same by the Owner and Architect.
22. If a contractor misses any portion of a workday due to weather, manpower, or scheduling conflicts, they must make-up this lost time on Saturday of the same week. If two or more days are lost in the same work week, the contractor shall work the immediate Saturday and the Saturday(s) of the following week(s) to make up those lost days.
23. Sundays are not regular work days. Approval must be obtained from Whiting-Turner prior to working. It is expected that contractors will work Saturdays, Sundays, and overtime when days are lost during the week.
24. Failure to properly man the project during normal week days may result in charges for CM supervision on weekends, at the discretion of the CM.
25. The contractor must schedule their work forces to work on all available work at a given time. Therefore, if an area of the building is ready for the contractor's work to begin or continue,

the contractor must have manpower onsite working. Contractors will not have the "entire" work area at one time.

26. Each contractor must request information or clarifications in a timely manner, at least two weeks prior to needing the information, so that the time required to receive the clarification does not impact the work. No delays will be accepted related to this issue.
27. Each contractor is required to include in their bid the necessary overtime costs if they are needed to meet the schedule durations in this section.

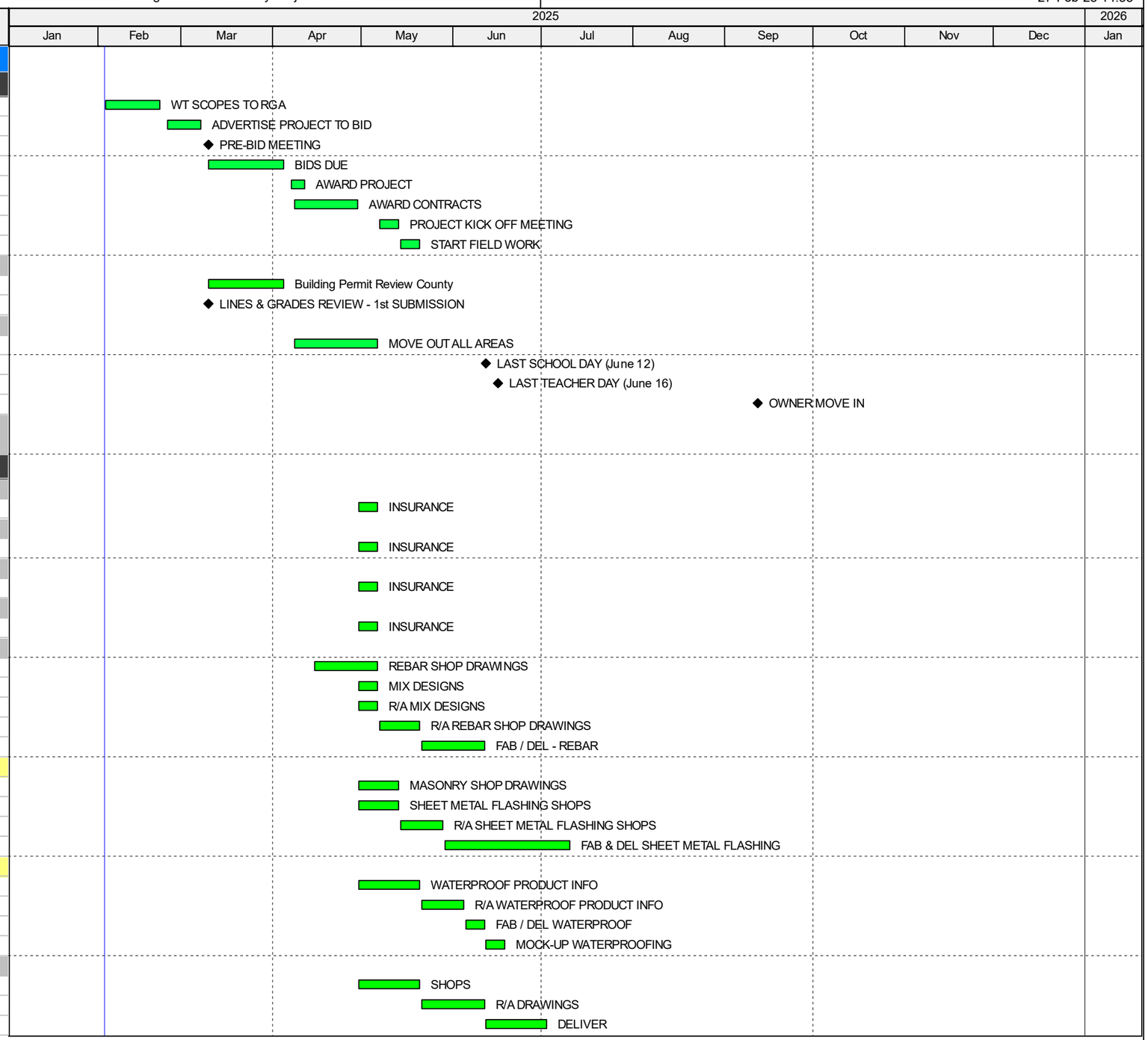
2.1 Time of Completion

1. The Trade Contractor shall commence work upon receipt of a Letter of Authorization to proceed from either Appoquinimink School District or The Whiting-Turner Contracting Company.
2. All work shall be 100 percent (100%) complete and sequenced per the attached schedule unless agreed upon by the Construction Manager prior to the executing of the contract.
3. Work can be completed on Saturdays and Sundays and at extended hours during the week. The Owner shall not be responsible for additional costs for overtime.
4. Normal work hours shall be from 7:00 a.m. to 3:30 p.m., Monday to Friday, and 8:00 a.m. to 4:30 pm on Saturday, when applicable. Work may be completed beyond these hours, as approved by the Construction Manager.
5. Weather Delays: The project substantial completion date, shall only be adjusted due to weather conditions if there are delays above and beyond the following "Adverse Day" allowances based on a seven day work week:
   A. January (12), February (10), March (5), April (5), May (4), June (2), July (4), August (3 days), September (4 days), October (3 days), November (2 days), and December (6 days). These "Adverse Days" are based on the following reference: State of Delaware Department of Transportation's Standard: "763508 Project Control System."
   B. Delays requested due to weather must be related to the critical path activity as indicated on the Contractor's Project Schedule.
   C. Delays due to weather must be reported by the contractor on the day they occur in a written report.
   D. Any day lost during the week must be made up the same week by overtime and /or weekend work. If the weather is bad on the make-up day, the lost day must be made up the following week.
   E. The allowance days listed above carry over to the next month if they are not used. Therefore, if only 1 allowance day is used in November, there are (7) days in December. Therefore, there is a total of 60 allowance days in a year.

3.1 See attached Project Schedule

END OF SECTION 01 32 10

Activity ID	Activity Name	Original Duration	Start	Finish
Appo Admin Office Renovation - (for bid)		176	03-Feb-25	10-Oct-25
BIDDING & PRECONSTRUCTION-1		155	03-Feb-25	12-Sep-25
1000	WT SCOPES TO RGA	15	03-Feb-25	21-Feb-25
1010	ADVERTISE PROJECT TO BID	10	24-Feb-25	07-Mar-25
1065	PRE-BID MEETING	0	10-Mar-25	
1070	BIDS DUE	20	10-Mar-25	04-Apr-25
1075	AWARD PROJECT	5	07-Apr-25	11-Apr-25
1085	AWARD CONTRACTS	15	08-Apr-25	29-Apr-25
1090	PROJECT KICK OFF MEETING	5	07-May-25	13-May-25
1095	START FIELD WORK	5	14-May-25	20-May-25
PERMITS		20	10-Mar-25	04-Apr-25
D1130	Building Permit Review County	20	10-Mar-25	04-Apr-25
D1100	LINES & GRADES REVIEW - 1st SUBMISSION	0	10-Mar-25	
OWNER MOVE OUT / MOVE IN		109	08-Apr-25	12-Sep-25
O1010	MOVE OUT ALL AREAS	20	08-Apr-25	06-May-25
O1020	LAST SCHOOL DAY (June 12)	0		12-Jun-25*
O1030	LAST TEACHER DAY (June 16)	0		16-Jun-25*
O1040	OWNER MOVE IN	0	12-Sep-25	
LOST WEATHER DAYS		0		
FRAGNETS		0		
PROCUREMENT / SUBMITTALS		110	15-Apr-25	19-Sep-25
00A - SOFT DIG LOCATE		5	30-Apr-25	06-May-25
P0000	INSURANCE	5	30-Apr-25	06-May-25
01A - SURVEYING		5	30-Apr-25	06-May-25
P0100	INSURANCE	5	30-Apr-25	06-May-25
01B - TEMP FENCING		5	30-Apr-25	06-May-25
P0200	INSURANCE	5	30-Apr-25	06-May-25
02A - DEMO		5	30-Apr-25	06-May-25
A99480	INSURANCE	5	30-Apr-25	06-May-25
03A - CONCRETE		60	15-Apr-25	10-Jul-25
P3000	REBAR SHOP DRAWINGS	15	15-Apr-25	06-May-25
P3060	MIX DESIGNS	5	30-Apr-25	06-May-25
P3070	R/A MIX DESIGNS	5	30-Apr-25	06-May-25
P3010	R/A REBAR SHOP DRAWINGS	10	07-May-25	20-May-25
P3020	FAB / DEL - REBAR	15	21-May-25	11-Jun-25
04A - MASONRY		50	30-Apr-25	10-Jul-25
P4000	MASONRY SHOP DRAWINGS	10	30-Apr-25	13-May-25
P4010	SHEET METAL FLASHING SHOPS	10	30-Apr-25	13-May-25
P4020	R/A SHEET METAL FLASHING SHOPS	10	14-May-25	28-May-25
P4030	FAB & DEL SHEET METAL FLASHING	30	29-May-25	10-Jul-25
07A - WATERPROOFING		35	30-Apr-25	18-Jun-25
P7100	WATERPROOF PRODUCT INFO	15	30-Apr-25	20-May-25
P7110	R/A WATERPROOF PRODUCT INFO	10	21-May-25	04-Jun-25
P7120	FAB / DEL WATERPROOF	5	05-Jun-25	11-Jun-25
P7130	MOCK-UP WATERPROOFING	5	12-Jun-25	18-Jun-25
05A - METALS		45	30-Apr-25	02-Jul-25
P5000	SHOPS	15	30-Apr-25	20-May-25
P5005	R/A DRAWINGS	15	21-May-25	11-Jun-25
P5010	DELIVER	15	12-Jun-25	02-Jul-25

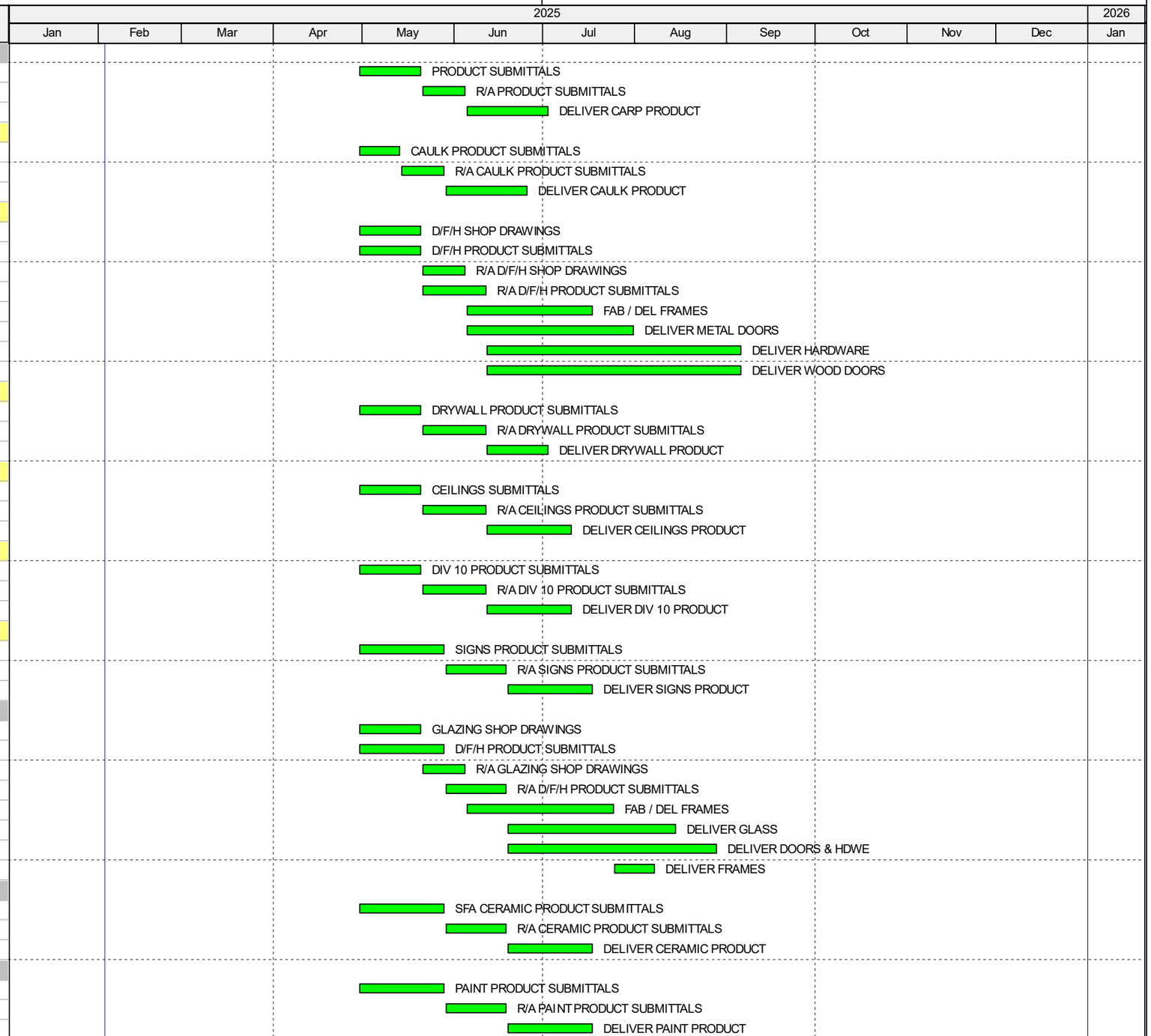


Actual Work | Critical Remaining Work | Remaining Work | Milestone

TASK filter: All Activities

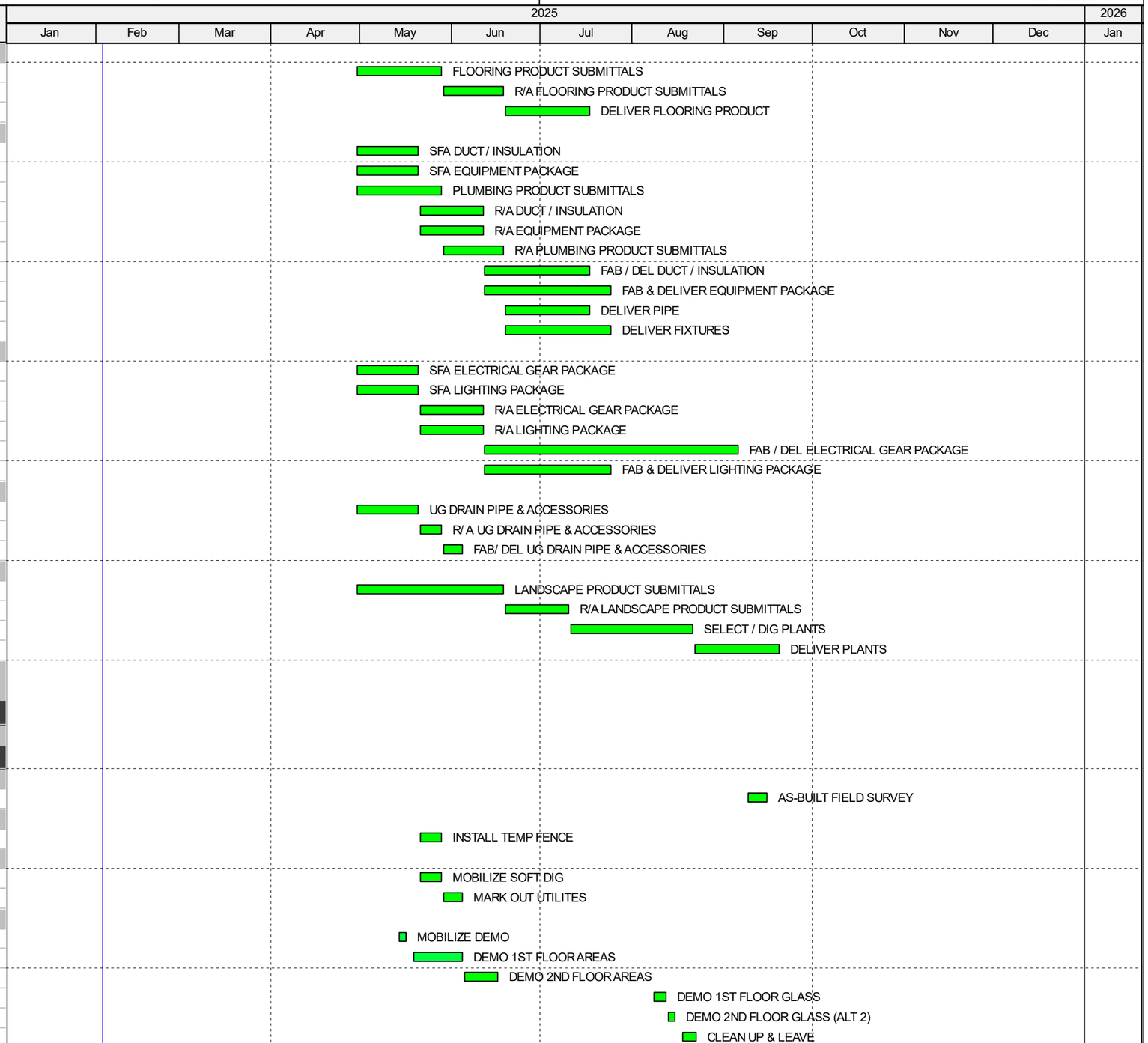
© Oracle Corporation

Activity ID	Activity Name	Original Duration	Start	Finish
06A - GEN. TRADES / CARPENTRY		90	30-Apr-25	05-Sep-25
P31360	PRODUCT SUBMITTALS	15	30-Apr-25	20-May-25
P31370	R/A PRODUCT SUBMITTALS	10	21-May-25	04-Jun-25
P31380	DELIVER CARP PRODUCT	20	05-Jun-25	02-Jul-25
07C - CAULKING		40	30-Apr-25	25-Jun-25
P7300	CAULK PRODUCT SUBMITTALS	10	30-Apr-25	13-May-25
P7310	R/A CAULK PRODUCT SUBMITTALS	10	14-May-25	28-May-25
P7320	DELIVER CAULK PRODUCT	20	29-May-25	25-Jun-25
08A - D/F/H		90	30-Apr-25	05-Sep-25
P8100	D/F/H SHOP DRAWINGS	15	30-Apr-25	20-May-25
P8130	D/F/H PRODUCT SUBMITTALS	15	30-Apr-25	20-May-25
P8110	R/A D/F/H SHOP DRAWINGS	10	21-May-25	04-Jun-25
P8140	R/A D/F/H PRODUCT SUBMITTALS	15	21-May-25	11-Jun-25
P8120	FAB / DEL FRAMES	30	05-Jun-25	17-Jul-25
P8150	DELIVER METAL DOORS	40	05-Jun-25	31-Jul-25
P8160	DELIVER HARDWARE	60	12-Jun-25	05-Sep-25
P8170	DELIVER WOOD DOORS	60	12-Jun-25	05-Sep-25
09A - DRYWALL		45	30-Apr-25	02-Jul-25
P9100	DRYWALL PRODUCT SUBMITTALS	15	30-Apr-25	20-May-25
P9110	R/A DRYWALL PRODUCT SUBMITTALS	15	21-May-25	11-Jun-25
P9120	DELIVER DRYWALL PRODUCT	15	12-Jun-25	02-Jul-25
09B - CEILINGS		50	30-Apr-25	10-Jul-25
P9200	CEILINGS SUBMITTALS	15	30-Apr-25	20-May-25
P9210	R/A CEILINGS PRODUCT SUBMITTALS	15	21-May-25	11-Jun-25
P9220	DELIVER CEILINGS PRODUCT	20	12-Jun-25	10-Jul-25
10A - TOILET PARTITIONS / ACCESORIES		50	30-Apr-25	10-Jul-25
P10100	DIV 10 PRODUCT SUBMITTALS	15	30-Apr-25	20-May-25
P10110	R/A DIV 10 PRODUCT SUBMITTALS	15	21-May-25	11-Jun-25
P10120	DELIVER DIV 10 PRODUCT	20	12-Jun-25	10-Jul-25
10B - SIGNS		55	30-Apr-25	17-Jul-25
P10300	SIGNS PRODUCT SUBMITTALS	20	30-Apr-25	28-May-25
P10310	R/A SIGNS PRODUCT SUBMITTALS	15	29-May-25	18-Jun-25
P10320	DELIVER SIGNS PRODUCT	20	19-Jun-25	17-Jul-25
08A - GLAZING		85	30-Apr-25	28-Aug-25
P31390	GLAZING SHOP DRAWINGS	15	30-Apr-25	20-May-25
P31420	D/F/H PRODUCT SUBMITTALS	20	30-Apr-25	28-May-25
P31400	R/A GLAZING SHOP DRAWINGS	10	21-May-25	04-Jun-25
P31430	R/A D/F/H PRODUCT SUBMITTALS	15	29-May-25	18-Jun-25
P31410	FAB / DEL FRAMES	35	05-Jun-25	24-Jul-25
P31450	DELIVER GLASS	40	19-Jun-25	14-Aug-25
P31460	DELIVER DOORS & HDWE	50	19-Jun-25	28-Aug-25
P31440	DELIVER FRAMES	10	25-Jul-25	07-Aug-25
09C - CERAMIC		55	30-Apr-25	17-Jul-25
P9300	SFA CERAMIC PRODUCT SUBMITTALS	20	30-Apr-25	28-May-25
P9310	R/A CERAMIC PRODUCT SUBMITTALS	15	29-May-25	18-Jun-25
P9320	DELIVER CERAMIC PRODUCT	20	19-Jun-25	17-Jul-25
09D - PAINTING		55	30-Apr-25	17-Jul-25
P9400	PAINT PRODUCT SUBMITTALS	20	30-Apr-25	28-May-25
P9410	R/A PAINT PRODUCT SUBMITTALS	15	29-May-25	18-Jun-25
P9420	DELIVER PAINT PRODUCT	20	19-Jun-25	17-Jul-25



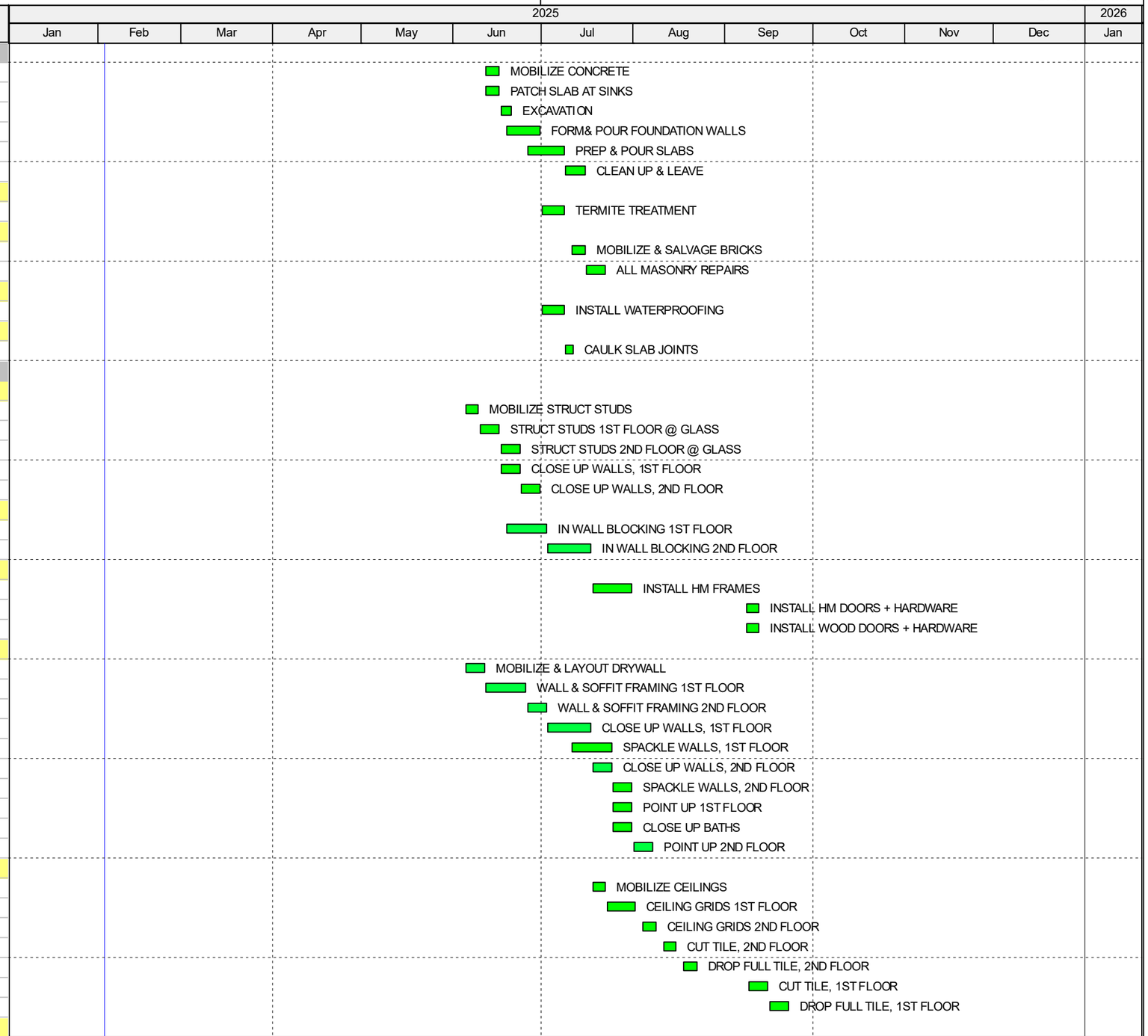
© Oracle Corporation

Activity ID	Activity Name	Original Duration	Start	Finish
09F - FLOORING		55	30-Apr-25	17-Jul-25
P9600	FLOORING PRODUCT SUBMITTALS	20	30-Apr-25	28-May-25
P9610	R/A FLOORING PRODUCT SUBMITTALS	15	29-May-25	18-Jun-25
P9620	DELIVER FLOORING PRODUCT	20	19-Jun-25	17-Jul-25
23A - HVAC / PLUMBING		60	30-Apr-25	24-Jul-25
P23100	SFA DUCT / INSULATION	15	30-Apr-25	20-May-25
P23110	SFA EQUIPMENT PACKAGE	15	30-Apr-25	20-May-25
P23200	PLUMBING PRODUCT SUBMITTALS	20	30-Apr-25	28-May-25
P23120	R/A DUCT / INSULATION	15	21-May-25	11-Jun-25
P23130	R/A EQUIPMENT PACKAGE	15	21-May-25	11-Jun-25
P23210	R/A PLUMBING PRODUCT SUBMITTALS	15	29-May-25	18-Jun-25
P23140	FAB / DEL DUCT / INSULATION	25	12-Jun-25	17-Jul-25
P23150	FAB & DELIVER EQUIPMENT PACKAGE	30	12-Jun-25	24-Jul-25
P23220	DELIVER PIPE	20	19-Jun-25	17-Jul-25
P23230	DELIVER FIXTURES	25	19-Jun-25	24-Jul-25
26A - ELECTRICAL		90	30-Apr-25	05-Sep-25
P26100	SFA ELECTRICAL GEAR PACKAGE	15	30-Apr-25	20-May-25
P26160	SFA LIGHTING PACKAGE	15	30-Apr-25	20-May-25
P26110	R/A ELECTRICAL GEAR PACKAGE	15	21-May-25	11-Jun-25
P26170	R/A LIGHTING PACKAGE	15	21-May-25	11-Jun-25
P26120	FAB / DEL ELECTRICAL GEAR PACKAGE	60	12-Jun-25	05-Sep-25
P26180	FAB & DELIVER LIGHTING PACKAGE	30	12-Jun-25	24-Jul-25
31A - SITEWORK		25	30-Apr-25	04-Jun-25
P31120	UG DRAIN PIPE & ACCESSORIES	15	30-Apr-25	20-May-25
P31130	R/ A UG DRAIN PIPE & ACCESSORIES	5	21-May-25	28-May-25
P31140	FAB/ DEL UG DRAIN PIPE & ACCESSORIES	5	29-May-25	04-Jun-25
32A - LANDSCAPING		100	30-Apr-25	19-Sep-25
P31300	LANDSCAPE PRODUCT SUBMITTALS	35	30-Apr-25	18-Jun-25
P31310	R/A LANDSCAPE PRODUCT SUBMITTALS	15	19-Jun-25	10-Jul-25
P31320	SELECT / DIG PLANTS	30	11-Jul-25	21-Aug-25
P31350	DELIVER PLANTS	20	22-Aug-25	19-Sep-25
12A - ROLLER SHADES		0		
12B - CABINETRY		0		
CONSTRUCTION OVERALL		0		
BUILDING WORK		0		
CONSTRUCTION - DETAILED SUB ACT		95	14-May-25	26-Sep-25
01A - SURVEY		5	09-Sep-25	15-Sep-25
S4060	AS-BUILT FIELD SURVEY	5	09-Sep-25	15-Sep-25
01B - TEMP FENCING		5	21-May-25	28-May-25
A99420	INSTALL TEMP FENCE	5	21-May-25	28-May-25
01C - SOFT DIG		10	21-May-25	04-Jun-25
A99380	MOBILIZE SOFT DIG	5	21-May-25	28-May-25
A99390	MARK OUT UTILITES	5	29-May-25	04-Jun-25
02A - DEMOLITION		71	14-May-25	22-Aug-25
A2000	MOBILIZE DEMO	3	14-May-25	16-May-25
A2010	DEMO 1ST FLOOR AREAS	12	19-May-25	04-Jun-25
A2020	DEMO 2ND FLOOR AREAS	8	05-Jun-25	16-Jun-25
A2030	DEMO 1ST FLOOR GLASS	3	08-Aug-25	12-Aug-25
A2040	DEMO 2ND FLOOR GLASS (ALT 2)	3	13-Aug-25	15-Aug-25
A2050	CLEAN UP & LEAVE	5	18-Aug-25	22-Aug-25



© Oracle Corporation

Activity ID	Activity Name	Original Duration	Start	Finish
03A - CONCRETE		28	12-Jun-25	22-Jul-25
A3100	MOBILIZE CONCRETE	3	12-Jun-25	16-Jun-25
A3140	PATCH SLAB AT SINKS	3	12-Jun-25	16-Jun-25
A3110	EXCAVATION	4	17-Jun-25	20-Jun-25
A3120	FORM& POUR FOUNDATION WALLS	8	19-Jun-25	30-Jun-25
A3130	PREP & POUR SLABS	8	26-Jun-25	08-Jul-25
A3150	CLEAN UP & LEAVE	5	09-Jul-25	15-Jul-25
03B - TERMITE CONTROL		5	01-Jul-25	08-Jul-25
A3200	TERMITE TREATMENT	5	01-Jul-25	08-Jul-25
04A - MASONRY		8	11-Jul-25	22-Jul-25
A4000	MOBILIZE & SALVAGE BRICKS	3	11-Jul-25	15-Jul-25
A4020	ALL MASONRY REPAIRS	5	16-Jul-25	22-Jul-25
07B - WATERPROOF		5	01-Jul-25	08-Jul-25
A7100	INSTALL WATERPROOFING	5	01-Jul-25	08-Jul-25
07C - CAULKING		3	09-Jul-25	11-Jul-25
A7200	CAULK SLAB JOINTS	3	09-Jul-25	11-Jul-25
06A - GENERAL TRADES		76	05-Jun-25	22-Sep-25
05B - STRUCT STUDS		18	05-Jun-25	30-Jun-25
A5100	MOBILIZE STRUCT STUDS	3	05-Jun-25	09-Jun-25
A5110	STRUCT STUDS 1ST FLOOR @ GLASS	5	10-Jun-25	16-Jun-25
A5120	STRUCT STUDS 2ND FLOOR @ GLASS	5	17-Jun-25	23-Jun-25
A5130	CLOSE UP WALLS, 1ST FLOOR	5	17-Jun-25	23-Jun-25
A5140	CLOSE UP WALLS, 2ND FLOOR	5	24-Jun-25	30-Jun-25
06B - CARPENTRY		20	19-Jun-25	17-Jul-25
A6100	IN WALL BLOCKING 1ST FLOOR	10	19-Jun-25	02-Jul-25
A6110	IN WALL BLOCKING 2ND FLOOR	10	03-Jul-25	17-Jul-25
08A - DOORS / FRAMES / HDWE		40	18-Jul-25	12-Sep-25
A8010	INSTALL HM FRAMES	10	18-Jul-25	31-Jul-25
A8020	INSTALL HM DOORS + HARDWARE	5	08-Sep-25	12-Sep-25
A99430	INSTALL WOOD DOORS + HARDWARE	5	08-Sep-25	12-Sep-25
09A - DRYWALL		45	05-Jun-25	07-Aug-25
A9000	MOBILIZE & LAYOUT DRYWALL	5	05-Jun-25	11-Jun-25
A9005	WALL & SOFFIT FRAMING 1ST FLOOR	10	12-Jun-25	25-Jun-25
A9010	WALL & SOFFIT FRAMING 2ND FLOOR	5	26-Jun-25	02-Jul-25
A9015	CLOSE UP WALLS, 1ST FLOOR	10	03-Jul-25	17-Jul-25
A9025	SPACKLE WALLS, 1ST FLOOR	10	11-Jul-25	24-Jul-25
A9020	CLOSE UP WALLS, 2ND FLOOR	5	18-Jul-25	24-Jul-25
A9035	SPACKLE WALLS, 2ND FLOOR	5	25-Jul-25	31-Jul-25
A9030	POINT UP 1ST FLOOR	5	25-Jul-25	31-Jul-25
A9045	CLOSE UP BATHS	5	25-Jul-25	31-Jul-25
A9040	POINT UP 2ND FLOOR	5	01-Aug-25	07-Aug-25
09B - CEILINGS		46	18-Jul-25	22-Sep-25
A9200	MOBILIZE CEILINGS	3	18-Jul-25	22-Jul-25
A9205	CEILING GRIDS 1ST FLOOR	8	23-Jul-25	01-Aug-25
A9210	CEILING GRIDS 2ND FLOOR	5	04-Aug-25	08-Aug-25
A9220	CUT TILE, 2ND FLOOR	5	11-Aug-25	15-Aug-25
A9235	DROP FULL TILE, 2ND FLOOR	5	18-Aug-25	22-Aug-25
A9215	CUT TILE, 1ST FLOOR	5	09-Sep-25	15-Sep-25
A9225	DROP FULL TILE, 1ST FLOOR	5	16-Sep-25	22-Sep-25
10A - TOILET PARTITIONS / ACCESORIES		5	22-Aug-25	28-Aug-25

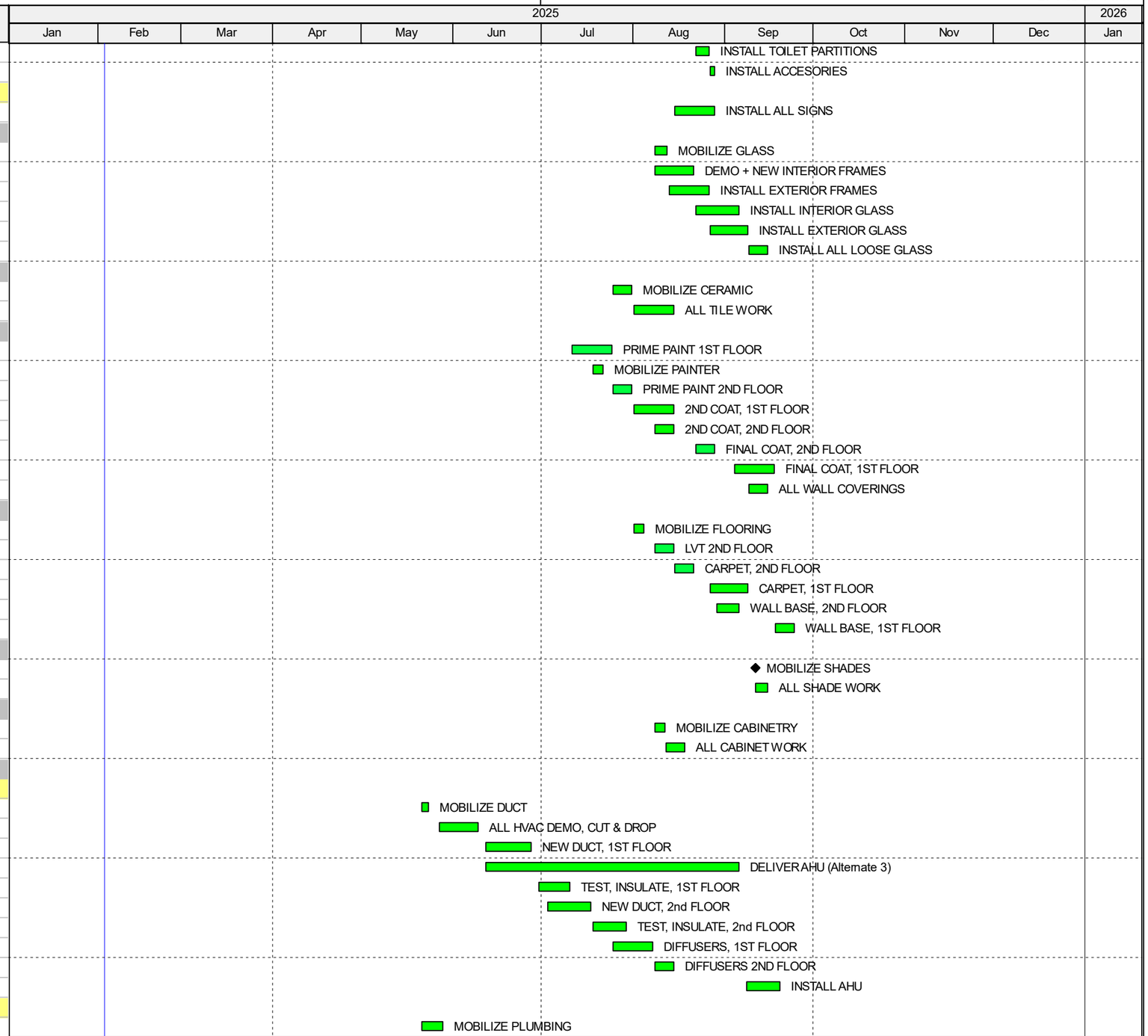


Actual Work | Critical Remaining Work | Remaining Work | Milestone

TASK filter: All Activities

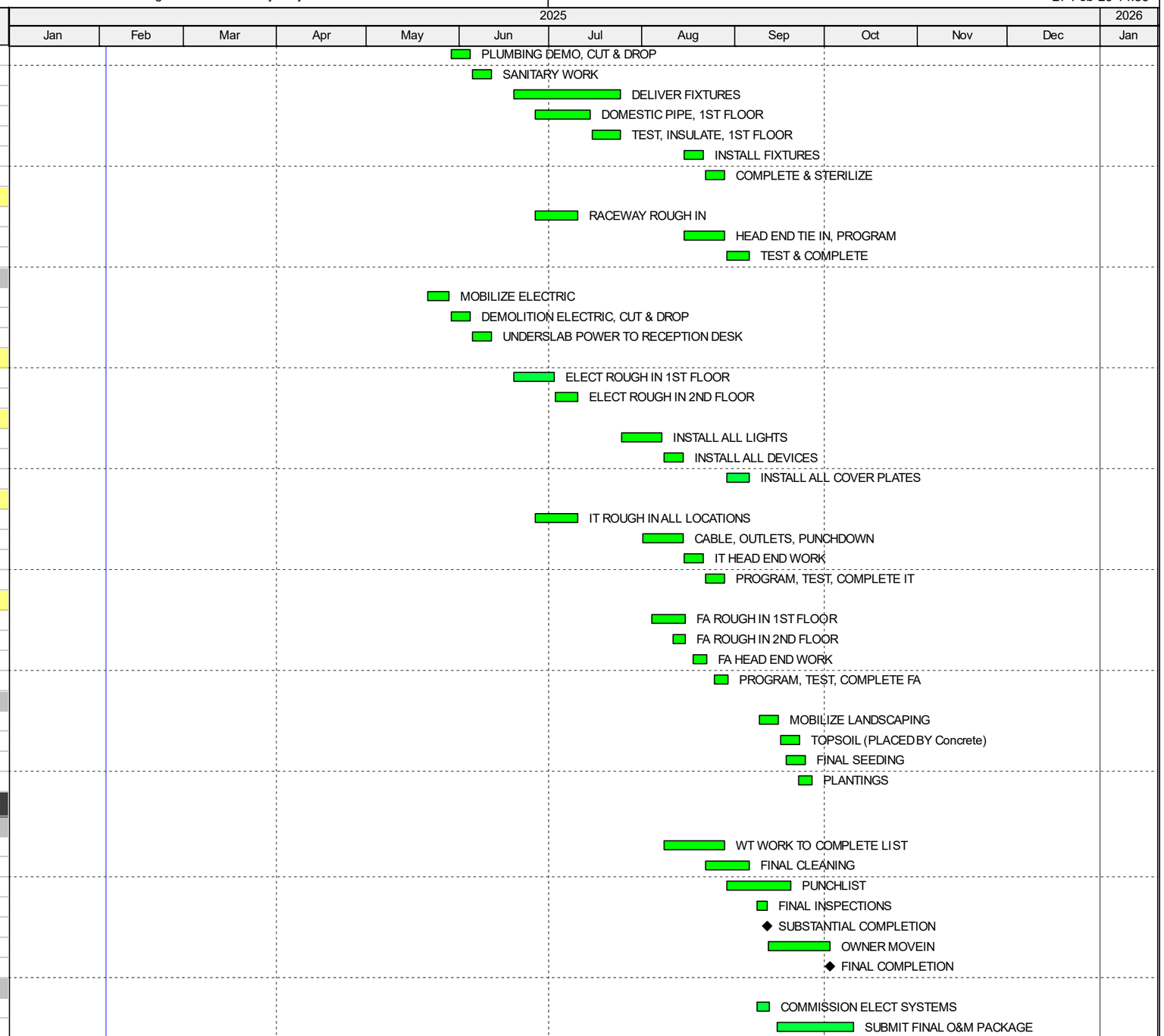
© Oracle Corporation

Activity ID	Activity Name	Original Duration	Start	Finish
A10100	INSTALL TOILET PARTITIONS	3	22-Aug-25	26-Aug-25
A10110	INSTALL ACCESORIES	2	27-Aug-25	28-Aug-25
10B - SIGNS		10	15-Aug-25	28-Aug-25
A10200	INSTALL ALL SIGNS	10	15-Aug-25	28-Aug-25
08C - STOREFRONT / SLIDING ENTRANCES		26	08-Aug-25	15-Sep-25
A8300	MOBILIZE GLASS	3	08-Aug-25	12-Aug-25
A8340	DEMO + NEW INTERIOR FRAMES	10	08-Aug-25	21-Aug-25
A8310	INSTALL EXTERIOR FRAMES	10	13-Aug-25	26-Aug-25
A8350	INSTALL INTERIOR GLASS	10	22-Aug-25	05-Sep-25
A8320	INSTALL EXTERIOR GLASS	8	27-Aug-25	08-Sep-25
A8330	INSTALL ALL LOOSE GLASS	5	09-Sep-25	15-Sep-25
09C - TILE		15	25-Jul-25	14-Aug-25
A9300	MOBILIZE CERAMIC	5	25-Jul-25	31-Jul-25
A9310	ALL TILE WORK	10	01-Aug-25	14-Aug-25
09D - PAINTING		48	11-Jul-25	17-Sep-25
A9410	PRIME PAINT 1ST FLOOR	10	11-Jul-25	24-Jul-25
A9400	MOBILIZE PAINTER	2	18-Jul-25	21-Jul-25
A9420	PRIME PAINT 2ND FLOOR	5	25-Jul-25	31-Jul-25
A9430	2ND COAT, 1ST FLOOR	10	01-Aug-25	14-Aug-25
A9440	2ND COAT, 2ND FLOOR	5	08-Aug-25	14-Aug-25
A9460	FINAL COAT, 2ND FLOOR	5	22-Aug-25	28-Aug-25
A9450	FINAL COAT, 1ST FLOOR	10	04-Sep-25	17-Sep-25
A9470	ALL WALL COVERINGS	5	09-Sep-25	15-Sep-25
09F - FLOORING		38	01-Aug-25	24-Sep-25
A9600	MOBILIZE FLOORING	2	01-Aug-25	04-Aug-25
A9605	LVT 2ND FLOOR	5	08-Aug-25	14-Aug-25
A9620	CARPET, 2ND FLOOR	5	15-Aug-25	21-Aug-25
A9610	CARPET, 1ST FLOOR	8	27-Aug-25	08-Sep-25
A9640	WALL BASE, 2ND FLOOR	5	29-Aug-25	05-Sep-25
A9630	WALL BASE, 1ST FLOOR	5	18-Sep-25	24-Sep-25
12A - ROLLER SHADES		3	11-Sep-25	15-Sep-25
A99440	MOBILIZE SHADES	0	11-Sep-25	
A99450	ALL SHADE WORK	3	11-Sep-25	15-Sep-25
12B - CABINETRY		7	08-Aug-25	18-Aug-25
A99460	MOBILIZE CABINETRY	2	08-Aug-25	11-Aug-25
A99470	ALL CABINET WORK	5	12-Aug-25	18-Aug-25
23A - HVAC / PLUMBING		85	21-May-25	19-Sep-25
DUCT & EQUIP		85	21-May-25	19-Sep-25
A23000	MOBILIZE DUCT	3	21-May-25	23-May-25
A23010	ALL HVAC DEMO, CUT & DROP	10	27-May-25	09-Jun-25
A23020	NEW DUCT, 1ST FLOOR	12	12-Jun-25	27-Jun-25
A23080	DELIVER AHU (Alternate 3)	60	12-Jun-25	05-Sep-25
A23030	TEST, INSULATE, 1ST FLOOR	8	30-Jun-25	10-Jul-25
A23040	NEW DUCT, 2nd FLOOR	10	03-Jul-25	17-Jul-25
A23050	TEST, INSULATE, 2nd FLOOR	8	18-Jul-25	29-Jul-25
A23060	DIFFUSERS, 1ST FLOOR	10	25-Jul-25	07-Aug-25
A23070	DIFFUSERS 2ND FLOOR	5	08-Aug-25	14-Aug-25
A23090	INSTALL AHU	10	08-Sep-25	19-Sep-25
PLUMBING		70	21-May-25	28-Aug-25
A23200	MOBILIZE PLUMBING	5	21-May-25	28-May-25



© Oracle Corporation

Activity ID	Activity Name	Original Duration	Start	Finish
A23210	PLUMBING DEMO, CUT & DROP	5	29-May-25	04-Jun-25
A23220	SANITARY WORK	5	05-Jun-25	11-Jun-25
A23250	DELIVER FIXTURES	25	19-Jun-25	24-Jul-25
A23230	DOMESTIC PIPE, 1ST FLOOR	12	26-Jun-25	14-Jul-25
A23240	TEST, INSULATE, 1ST FLOOR	8	15-Jul-25	24-Jul-25
A23260	INSTALL FIXTURES	5	15-Aug-25	21-Aug-25
A23270	COMPLETE & STERILIZE	5	22-Aug-25	28-Aug-25
ATC / CONTROLS		50	26-Jun-25	05-Sep-25
A23400	RACEWAY ROUGH IN	10	26-Jun-25	10-Jul-25
A23410	HEAD END TIE IN, PROGRAM	10	15-Aug-25	28-Aug-25
A23420	TEST & COMPLETE	5	29-Aug-25	05-Sep-25
26A - ELECTRICAL		75	21-May-25	05-Sep-25
A26010	MOBILIZE ELECTRIC	5	21-May-25	28-May-25
A26020	DEMOLITION ELECTRIC, CUT & DROP	5	29-May-25	04-Jun-25
A26030	UNDERSLAB POWER TO RECEPTION DESK	5	05-Jun-25	11-Jun-25
BRANCH CONDUIT & POWER		15	19-Jun-25	10-Jul-25
A23100	ELECT ROUGH IN 1ST FLOOR	10	19-Jun-25	02-Jul-25
A23110	ELECT ROUGH IN 2ND FLOOR	5	03-Jul-25	10-Jul-25
LIGHTING & DEVICES		30	25-Jul-25	05-Sep-25
A26200	INSTALL ALL LIGHTS	10	25-Jul-25	07-Aug-25
A26210	INSTALL ALL DEVICES	5	08-Aug-25	14-Aug-25
A26220	INSTALL ALL COVER PLATES	5	29-Aug-25	05-Sep-25
IT, SECURITY WORK		45	26-Jun-25	28-Aug-25
A26300	IT ROUGH IN ALL LOCATIONS	10	26-Jun-25	10-Jul-25
A26310	CABLE, OUTLETS, PUNCHDOWN	10	01-Aug-25	14-Aug-25
A26320	IT HEAD END WORK	5	15-Aug-25	21-Aug-25
A26330	PROGRAM, TEST, COMPLETE IT	5	22-Aug-25	28-Aug-25
FIRE ALARM		20	04-Aug-25	29-Aug-25
A26400	FA ROUGH IN 1ST FLOOR	10	04-Aug-25	15-Aug-25
A26410	FA ROUGH IN 2ND FLOOR	5	11-Aug-25	15-Aug-25
A26420	FA HEAD END WORK	5	18-Aug-25	22-Aug-25
A26430	PROGRAM, TEST, COMPLETE FA	5	25-Aug-25	29-Aug-25
32A - LANDSCAPING (By Owner)		14	09-Sep-25	26-Sep-25
S2000	MOBILIZE LANDSCAPING	5	09-Sep-25	15-Sep-25
S2010	TOPSOIL (PLACED BY Concrete)	5	16-Sep-25	22-Sep-25
S2030	FINAL SEEDING	5	18-Sep-25	24-Sep-25
S2020	PLANTINGS	5	22-Sep-25	26-Sep-25
PROJECT CLOSE-OUT		45	08-Aug-25	10-Oct-25
INSPECTIONS & CLOSEOUT		39	08-Aug-25	02-Oct-25
A17000	WT WORK TO COMPLETE LIST	15	08-Aug-25	28-Aug-25
A17010	FINAL CLEANING	10	22-Aug-25	05-Sep-25
A17020	PUNCHLIST	15	29-Aug-25	19-Sep-25
A17030	FINAL INSPECTIONS	4	08-Sep-25	11-Sep-25
A17040	SUBSTANTIAL COMPLETION	0		11-Sep-25
A17050	OWNER MOVEIN	15	12-Sep-25	02-Oct-25
A17060	FINAL COMPLETION	0		02-Oct-25
COMMISIONING		25	08-Sep-25	10-Oct-25
A17080	COMMISSION ELECT SYSTEMS	5	08-Sep-25	12-Sep-25
A17090	SUBMIT FINAL O&M PACKAGE	20	15-Sep-25	10-Oct-25



© Oracle Corporation

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Concealed Work photographs.
3. Periodic construction photographs.
4. Final completion construction photographs.

1.2 INFORMATIONAL SUBMITTALS

A. 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.

B. Digital Photographs: Submit image files within three days of taking photographs.

1. Submit photos via email, ftp or similar manner. Include copy of key plan indicating each photograph's location and direction.
2. 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 and Construction Manager.
d. Name of Contractor.
e. Date photograph was taken.
f. Description of location, vantage point, and direction.
g. Unique sequential identifier keyed to accompanying key plan.

1.3 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.

1.4 FORMATS AND MEDIA

A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels. Use flash in low light levels or backlit conditions.

B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

C. Metadata: Record accurate date and time and GPS location data from camera.

D. File Names: Name media files with date and sequential numbering suffix.

1.5 CONSTRUCTION PHOTOGRAPHS

A. Photographer: Engage a qualified photographer to take construction photographs.

B. General: Take photographs with maximum depth of field and in focus.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

C. Preconstruction Photographs: Before commencement of the Work, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by [Architect] [Construction Manager].

1. Flag 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.

D. Concealed Work Photographs: Before proceeding with installing work that will conceal other work, take photographs sufficient in number, with annotated descriptions, to record nature and location of concealed Work, including, but not limited to, the following:
1. Underground utilities.
2. Underslab services.
3. Piping.
4. Electrical conduit.
5. Waterproofing and weather-resistant barriers.

E. Periodic Construction Photographs: Take 20 photographs weekly coinciding 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. Final Completion Construction Photographs: Take 50 photographs after date of Substantial Completion for submission as Project Record Documents. Architect will inform photographer of desired vantage points.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 33 00

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

B. Related Sections include the following:

1. Division 01 Section 01 29 00 "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
2. Division 01 Section 01 31 00 "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
3. Division 01 Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
4. Division 01 Section 01 40 00 "Quality Requirements" for submitting test and inspection reports and for mockup requirements.
5. Division 01 Section 01 77 00 "Closeout Procedures" for submitting warranties.
6. Division 01 Section 01 78 39 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
7. Divisions 02 through 49 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect’s responsive action.

B. Informational Submittals: Written information that does not require Architect’s responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. General:

1. Contractor shall submit electronic version of each individual submittal to the Architect in a printable PDF format. Format of PDF sheet should be of the same size as the hard copy submittal.

a. Submittals that are larger than 11x17 shall be submitted via one hard copy in addition to the electronic version.
b. Door hardware submittals shall be submitted with one hard copy in addition to the electronic version.

2. Contractor will be provided access to the Architect's secured project hosting site via a personalized password protected account. This site utilizes a web browser interface that requires internet access, and an individual email account.
3. Contractor shall be required to complete the Architect's Electronic Project Data Request Form.
4. Contractor will receive the necessary and applicable documentation for the purpose of providing submittals with the project hosting site when the account information is verified and configured by the Architect.
5. Architect will return submittals electronically in PDF format.
6. Contractor shall furnish one hard copy of each individual approved submittal as part of the final Operations and Maintenance Manuals.

B. Finish Submittals: Items requiring color, pattern, and similar selections shall be of sufficient size and quantity to clearly illustrate full range of color, texture, and pattern for Architects approval. Submit samples for selection of finishes within 60 days after Award of Contract, or earlier if requested at the Preconstruction Conference. Allow 60 days for Architects review of each submittal.

C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

a. **Architect reserves** the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

D. Submittals Schedule: Comply with requirements in Division 01 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

E. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on **Architect's** receipt of submittal. 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.

F. Identification: Submittal Cover Sheet shall be completed and attached to each individual hard and electronic submittals. Include Contractor's stamp with completed information. Submittals without a cover sheet will not be reviewed and will be returned to the Contractor.

G. Deviations: **Highlight, encircle,** or otherwise specifically identify deviations from the Contract Documents on submittals.

H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will **return submittals, without review,** received from sources other than Contractor.

1. Transmittal Form: Utilize the FORM PROVIDED IN THE PROJECT MANUAL, and provide the following information:

a. Project name.
b. Date.
c. Destination (To:).
d. Source (From:).
e. Names of subcontractor, manufacturer, and supplier.
f. Category and type of submittal.
g. Submittal purpose and description.
h. Specification Section number and title.
i. Drawing number and detail references, as appropriate.
j. Transmittal number**, numbered consecutively**.
k. Submittal and transmittal distribution record.
l. Remarks.
m. Signature of transmitter.

2. 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 label information as related submittal.

I. Resubmittals: Make resubmittals in same form 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.

J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

1.5 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

A. General: At Contractor's written request, access to copies of Architect's CAD files will only be provided to Prime Contractors solely for the Contractor's use in connection with the Project. Access to these files will be via a web based project site hosted by the Architect, which is subject to the terms and conditions identified in the Architect's "Electronic Project Data Request Form". This form will be provided to all successful Prime Contractors after the award of contract. The files that will be made available and the format in which they will be made available is identified in the form.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Submit electronic submittals directly to project hosting site specifically established for Project.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Standard color charts.
e. Manufacturer's catalog cuts.
f. Wiring diagrams showing factory-installed wiring.
g. Printed performance curves.
h. Operational range diagrams.
i. Mill reports.
j. Standard product operation and maintenance manuals.
k. Compliance with specified referenced standards.
l. Testing by recognized testing agency.
m. Application of testing agency labels and seals.
n. Notation of coordination requirements.

4. Submit Product Data before or concurrent with Samples.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data**, unless use of Architect's CAD Drawings are otherwise permitted**.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams.
e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
f. Shopwork manufacturing instructions.
g. Templates and patterns.
h. Schedules.
i. Design calculations.
j. Compliance with specified standards.
k. Notation of coordination requirements.
l. Notation of dimensions established by field measurement.
m. Relationship to adjoining construction clearly indicated.
n. Seal and signature of professional engineer if specified.
o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

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 but no larger than 24 by 36 inches.

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 appropriate Specification Section.

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.

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 three full set(s) 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 or List: 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.
2. Number and name of room or space.
3. Location within room or space.

F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation" for Contractor's action.

G. Submittals Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

H. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

I. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

J. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by individual Specification Sections.

1. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

2. Test and Inspection Reports: Comply with requirements specified in Division 01 Section "Quality Requirements."

B. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

C. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Installer Certificates: Prepare 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.

F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

G. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

I. Product Test Reports: Prepare written reports indicating 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.

J. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."

K. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

L. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

M. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

N. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

O. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

P. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

Q. Construction **Photographs**: Comply with requirements specified in Division 01 Section “Photographic Documentation."

R. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect**, except as required in "Action Submittals" Article**.

1. Architect will not review submittals that include MSDSs and will return or discard the entire submittal for resubmittal.

2.3 DELEGATED DESIGN

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 Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit statement, 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 CONSTRACTOR'S REVIEW

A. 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. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review submittal, make marks to indicate corrections or modifications, if required, and return it. Architect will stamp submittal with an action stamp and will mark stamp appropriately to indicate action taken as indicated on the Submittal Cover Sheet.

C. 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.

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 33 01

SUBMITTAL COVER SHEET FORM

See Continuation Sheet Attached Document.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

Date: _____ **Submission No.** _____ **No. of Copies** _____

TO: FROM:

R G Architects, LLC
200 West Main Street
Middletown, DE 19709

Project Name and No.: _____
Prime Contractor Name/Contract Number: _____
Subcontractor Name/Contract Number: _____
Product Specification Section Name/Number: _____
Drawing Number/Name: _____
Manufacturer: _____ **Supplier:** _____
NOTE: Use a separate Submittal Cover Sheet for each submittal Drawing or Catalog Cut.

Contractor/Subcontractor Comments: _____

Architect's Comments: _____

Contractor's Stamp:

A/E Stamp:

☐ APPROVED
Indicates submittal in design professional's opinion conforms to information given and design concept expressed in contract documents.

☐ APPROVED AS NOTED
Same as above after submittal has been modified as noted by design professional. Resubmittal is not required and Contractor may proceed in accordance with submittal as modified.

☐ NOT APPROVED
Indicates submittal in design professional's opinion does not conform with information given and design concept expressed in contract documents or that submittal does not meet procedural requirements of contract documents. Additional information may be provided by design professional.

R G ARCHITECT, LLC

Date: _____ By: _____

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 35 00 – SPECIAL PROJECT PROCEDURES

1.0 PROCEDURES

1.1 CONSTRUCTION MANAGER

A. The Construction Manager shall control, enforce, direct, instruct, and otherwise implement regulations and restrictions as set forth in this section.

1.2 OWNER'S REPRESENTATIVE

A. All communications with the owner and owner's representative(s) and consultant(s) shall be thru the Construction Manager unless otherwise noted in the General Conditions.

1.3 NOISE CONTROL

A. The Contractor shall execute the Work in this Contract as quietly as practicable to avoid unnecessary disturbances.

B. Any complaints duly registered by the Construction Manager of unacceptable noise levels shall be cause for the use of special precautions and methods of operation by the Contractor to reduce noise to acceptable levels.

C. The Owner and Construction Manager shall be the sole judge of the tolerability of noise levels.

D. Use of portable radios or tape recorders will not be allowed on the premises other than two-way communication radios.

E. The Contractor shall prepare a "Noise Schedule" as soon as practicable indicated the type of noise inducing work showing the dates, times and duration of such work. The Contractor should note any special instruction and/or time requirement in the Scopes of Work.

1.4 PERSONNEL IDENTIFICATION

A. All employees of the Contractor and all subcontractors may be required to wear numbered identification badges while on the premises of existing buildings.

B. The identification badges shall be conspicuously fixed to outer garments above elbow level.

C. Any of the Contractor's personnel or subcontractor's personnel who do not comply with this requirement at all times will be denied access to the facility or will be escorted off the premises by Security Guards or owner representative(s).

1.5 PERSONNEL PARKING

A. At no time shall the employees of the Contractor or subcontractor employed by Contractor be allowed to park their vehicles on-site without prior approval from the Construction Manager.

2.0 LIMIT OF OPERATIONS

A. It shall be noted that, adjacent streets will remain open throughout the duration of this Project. The Construction Manager will provide a perimeter fence, which will establish limits of operation.

B. The Contractor's normal limit of operations shall be confined within the Limits of Work Area as designated on the drawings.

C. The Owner, Architect, and other Contractors performing Work within these limits of operation, shall be allowed access at all times.

D. Construction operations must be planned and executed in a manner which allows emergency access to project.

3.0 SCHEDULING AND COORDINATION

3.1 SCHEDULING

A. All arrangements for work which will involve interference with normal Owner or adjacent properties functions, particularly in occupied areas, or adjacent thereto, shall be scheduled a minimum of 14 days in advance with the Construction Manager to provide for minimum of disruption and inconvenience.

3.2 OUTAGES

A. Utility and service outages shall be kept to a minimum, and will be permitted only with written approval of the Construction Manager and the Owner.

B. All requests for the outages shall be made a minimum of fourteen working days in advance of their need.

C. Requests for outages will not be considered unless they include an identification of all areas which will be affected by the proposed outage. Blank outage forms will be provided by the Construction Manager upon request.

D. All outages shall occur **after normal working hours.** All costs including premium time shall be included in the Bid amounts.

END OF SECTION 01 35 00

SECTION 01 35 20 – EH&S PLAN

CONTRACTOR / SUBCONTRACTOR EH&S MANUAL

All contractors and subcontractors on Whiting-Turner's projects bid and awarded after January 1, 2019 or earlier if provided in the Subcontract by Whiting- Turner, are expected to be in full compliance with all applicable requirements of the Whiting-Turner Contracting Company's Contractor/Subcontractor EH&S Manual ("Manual"). This Manual incorporates current Whiting- Turner requirements along with new practices that have become available and generally accepted in the industry. To obtain a copy of the Manual please contact the Whiting-Turner Project Manager on your project.

The information contained in this Manual is not intended to serve as a substitute for the exercise of good engineering judgment by the engineers nor as a substitute for determinations made by contractors/subcontractors of appropriate manner and methods of operations and safety aspects of work under their control. This Manual is also not intended to be all inclusive or replace a contractor's or subcontractor's corporate or site-specific safety program and is not intended to, nor shall it, supersede any more stringent federal, state, local and other applicable laws, codes, rules, regulations, and/or practices. All contractor's and subcontractor's site-specific safety programs must meet or exceed the requirements of the Whiting-Turner EH&S program, the contract documents and all federal, state, local and other applicable laws, codes, rules, regulations, and/or practices. In the event of any conflicts between the material contained therein and any more stringent laws, codes, rules, regulations, and/or practices, the more stringent laws, codes, rules, regulations, and/or practices shall govern.

This Manual and all information contained therein is confidential and intended for the sole use of contractors and subcontractors on Whiting-Turner projects. Contractors/subcontractors are prohibited from distributing this information to any third parties. The Whiting-Turner Contracting Company expressly disclaims warranties for the information contained in this Manual and makes no representations to third parties regarding the reliability, suitability, correctness, or completeness of such information. Whiting-Turner assumes no responsibility or liability and shall not be responsible and/or liable for damages or losses of any kind, including but not limited to direct, indirect, incidental, exemplary, special or consequential damages or losses, arising from, attributable to and/or resulting from the use of such information by third parties however caused and on any theory of liability, whether in contract, strict liability or tort.

For contractor/subcontractor convenience only, a synopsis of the Manual requirements is attached hereto. This synopsis is not intended to, nor shall it alleviate contractors'/subcontractors' obligations to comply with the requirements of the Manual as applicable to their work.

(Revised 1/2/19)

The Whiting-Turner Contracting Company
Contractor/Subcontractor EH&S Manual Synopsis

DISCLAIMER: For Contractor/Subcontractor's convenience only, the following is a Synopsis of some of the more significant provisions of The Whiting-Turner Contracting Company's Contractor/Subcontractor EH&S Manual ("Manual") requirements. This Synopsis is not intended to, nor shall it alleviate Contractor/Subcontractor's obligations to comply with all of the requirements of the Manual as applicable to Contractor/Subcontractor's scope of work, whether or not they are included in the Synopsis.

The information in the Manual and this Synopsis are not intended to serve as a substitute for the exercise of good engineering judgment by the engineers nor as a substitute for determinations made by Contractor/Subcontractor of appropriate manner and methods of operations and safety aspects of work under their control. The Manual and this Synopsis are also not intended to be all inclusive or replace a contractor's or subcontractor's corporate or site-specific safety program and is not intended to, nor shall they, supersede any more stringent federal, state, local and other applicable laws, codes, rules, regulations, and/or practices. All contractor's and subcontractor's site-specific safety programs must meet or exceed the requirements of the Whiting-Turner EH&S program, the contract documents and all federal, state, local and other applicable laws, codes, rules, regulations, and/or practices. In the event of any conflicts between the material contained therein and any more stringent laws, codes, rules, regulations, and/or practices, the more stringent laws, codes, rules, regulations, and/or practices shall govern.

The Contractor/ Subcontractor EH&S Manual, this Synopsis, and all information contained therein is confidential and intended for the sole use of contractors and subcontractors on Whiting-Turner projects. Contractors/subcontractors are prohibited from distributing this information to any third parties. The Whiting- Turner Contracting Company expressly disclaims warranties for the information contained in the Manual and this Synopsis and makes no representations to third parties regarding the reliability, suitability, correctness, or completeness of such information. Whiting-Turner assumes no responsibility or liability and shall not be responsible and/or liable for damages or losses of any kind, including but not limited to direct, indirect, incidental, exemplary, special or consequential damages or losses, arising from, attributable to and/or resulting from the use of such information by third parties however caused and on any theory of liability, whether in contract, strict liability or tort.

Pre-Construction Submittals

1. Contractor/subcontractor must identify and submit the qualifications of a safety representative/competent person to Whiting-Turner as the primary, on-site contact for safety related issues.
   - The safety representative may be a supervisor and they shall have as a minimum, the OSHA 30-hour Outreach Training Program for Construction.
   - The subcontractor will provide a first aid/CPR/AED trained competent person when one or more of the subcontractor's employees are working

2. Contractor/subcontractor must submit a completed prequalification form and respond in writing to Whiting-Turner's requests for additional information/explanation.

3. A site-specific safety plan (SSSP) shall be developed for the project by each contractor/subcontractor. The plan should address hazards and mitigation strategies related to the scope of work for the project. Activity Hazard Analysis (AHA) for major phases of work, submitted with the company safety program may be accepted in lieu of SSSP – at the discretion of the Whiting-Turner project team.

4. Site-specific Safety Data Sheets (SDS) are required to be submitted prior to bringing any chemical product on site. A current chemical inventory is to be maintained with Whiting- Turner.

5. An Activity Hazard Analysis (AHA) shall be submitted ten days prior to the start of work.

6. A competent person's acknowledgement form must be completed, and their qualifications submitted for activities where OSHA requires a competent person.

Safety Management

1. All on site personnel, (contractor/subcontractors, tiered contractors/subcontractors, and their employees) are required to participate in a mandatory safety orientation session prior to commencing with any work on site. Contractor/subcontractor shall provide a translator for any non-English speaking employees during orientation and any job wide meetings/stand- downs. Employees may be asked to attend orientation again for repeat violations or deficiencies.

2. Each contractor/subcontractor is required to designate a site safety representative (SSR). SSR shall be on site at all times and shall have the knowledge and authority of the competent person. SSR shall be able to conduct site walks with Whiting-Turner personnel to ensure the safety of contractor's/subcontractor's workers on the project. Manpower totals below include all tiered contractor/subcontractor employees. Proof of training must be submitted prior to mobilization or at orientation. The qualifications for the SSR are as follows:
   - Minimum requirement proof of OSHA 30 hour submitted
   - Contractors/subcontractors with (30) or more workers on site will be evaluated by the Whiting-Turner's management team along with Whiting-Turner's EH&S Manager regarding the contractor's/subcontractor's site-specific safety performance. If the contractor's/subcontractor's past or current site safety performance indicates improved safe work practices and conditions are needed to help ensure the safety of the contractor/subcontractor crews and others, Whiting-Turner at its discretion, may require the contractor/subcontractor to provide a fulltime Site Safety Representative to be present onsite with no other collateral duties.

3. The contractor's/subcontractor's supervisor(s) and safety representative must make frequent and regular inspections of their work areas and activities.
   - Hazards identified that are under their control must be corrected immediately and all other identified hazards must be reported to the Whiting-Turner superintendent.
   - One documented inspection shall be conducted each week.

4. The contractor's/subcontractor's on-site supervisor and the contractor's/subcontractor's designated on-site safety representative must schedule and attend a pre-construction safety meeting with the Whiting-Turner Superintendent to discuss the contractor/subcontractor safety requirements.
   - The pre-construction safety meeting should take place at least five (5) working days before startup to allow for review of required documentation.

5. The subcontractor shall provide a translator whenever there are non-English speaking tradespersons on site.

6. Contractor/subcontractors, who in turn contract out parts of their work, have sole responsibility to see that their lower tier contractors comply with project safety requirements. Additionally, Whiting-Turner's Project Manager and/or Whiting-Turner's Superintendent shall be notified that the lower tier contractors are arriving at least five (5) days before work starts. The Contractor/subcontractors will be held directly accountable for all lower tier contractors. Contractors/subcontractors must provide a competent person onsite fulltime to oversee and direct lower tier contractors' while actively performing work.

7. The subcontractor's superintendent(s) and/or designated safety representative must attend the weekly

coordination meeting where safety issues will be addressed.

8. Emergencies shall be handled through the Whiting-Turner Field Office according to the posted Emergency Action Plan.

9. All work-related injuries, regardless of severity, must be reported to Whiting-Turner immediately. An accident/incident investigation report must be completed by the appropriate subcontractor supervisor and submitted to Whiting-Turner within 24 hours of the incident. Further, all work-related injuries will be recorded on an injury log. A completed injury log will be submitted to Whiting-Turner by the 5th of the month for the previous month.
10. Incidents involving the public, regardless of severity, must be reported to Whiting-Turner immediately. An accident/incident investigation report must be completed by the appropriate subcontractor supervisor and submitted to Whiting-Turner within 24 hours of the incident.

11. Only communication radios are permitted on Whiting-Turner projects.

General Safe Work Practices and Guidelines

The following are prohibited on Whiting-Turner Projects

1. The use of the following administrative controls as a means of fall protection
   - Controlled Access Zone as a means of fall protection
   - Controlled Decking Zone as a means of fall protection
   - Safety Monitor System as a means of fall protection
2. The use of load handling equipment to hoist personnel—please see the Manual for exceptions and provisions
3. Working from the midrail or top rail of any lift
4. The use of cell phones for signaling of cranes and equipment
5. The use of open hooks during lifting operations/picks.
6. Fish tapes or lines made of metal or any other conductive material when potential for contact with energized circuits exists
7. The use of particle board, medium density fiber board (MDF) or similar material as floor hole covers
8. The use of open turnbuckles as part of the perimeter cable system
9. Other construction processes below steel erection are prohibited unless overhead protection for the employees below is provided
10. Harassment of any kind, to any person
11. Smoking or use of vaporized equipment (except in designated areas)
12. Radios, media players, headphones, or other listening devices
13. Guns or weapons of any kind
14. Use or possession of alcohol or drugs of any kind (except for prescription drugs)
15. Riding on equipment that is not equipped with proper seating and seat belt
16. Open fires, fire barrels, or hot boxes
17. The use of metal ladders

Carbon Monoxide Exposure Prevention

1. In enclosed or poorly ventilated spaces tools and equipment shall be powered by electricity, batteries, or compressed air.
2. All fuel driven equipment being used indoors or in partially enclosed spaces must have scrubbers where carbon monoxide exposure exists.
3. When using gasoline powered generators and compressors, place them outside away from air intakes to ensure that the exhaust is not being drawn back indoors.

Concrete and Masonry

1. Each contractor/subcontractor, with employees exposed to a fall 6' or greater to a lower level must ensure that effective fall protection measures and rescue procedures are addressed in their company Activity Hazard Analysis prior to beginning work on site. This is to include the name and qualifications of the designated competent person.

Confined Space Entry

1. It is Whiting-Turner's position that all confined spaces are permit required until proven otherwise [in writing] by the contractor/subcontractor's competent person.

2. All confined spaces, regardless of classification, shall have continuous multi-gas/4-gas air monitoring while the space is occupied by tradespersons.

Cranes and Derricks

1. Personnel hoisting requirements - The use of load handling equipment to hoist personnel is prohibited unless the employer can demonstrate that other methods would be more hazardous and is able to comply with the personnel hoisting requirements that are established in the standard.
2. Hoisting personnel on Whiting-Turner projects shall be considered a critical lift or activity, and therefore shall meet all requirements of a critical lift before the lift may begin.
3. A crane checklist must be completed prior to each initial lift.
4. Post Assembly – a post assembly inspection is required for all Crawlers and Tower Cranes by a person properly trained and qualified to inspect such equipment.
5. Boom-tip anemometer or equivalent device is required.
6. All loads to be lifted at Whiting-Turner project sites shall have a tag line attached.
   - The competent person shall determine the size, rope materials, and length of the tag line.
   - The line shall be attached in a way that maintains control of the load to reduce the risk of caught-in/-between and struck-by hazards to employees and surroundings during any lift.

Critical Lifts

1. The Whiting-Turner Contracting Company identifies a critical or special lift as
   - any lift where the total weight of the load and the deductions for the equipment combined exceeds 75% of the capacity of the crane capacity chart at the specific boom length and radius of the load,
   - any lift where there will be more than one (1) crane or piece of load handling equipment attached to the load at a time;
   - any lift that involves the lifting of personnel;
   - any lift where the contents of the lift are considered hazardous to health or environment, and an accidental release could result harm to either;
   - any lift where encroachments precautions are required for power lines.

Demolition

1. Contractor/subcontractor shall verify that all local ordinances and permitting issues have been addressed as they relate to demolition.
2. Generic safety data sheets for demolished material must be provided by the creating contractor.
3. Task lighting—which meets or exceeds the requirements of the standard—shall be provided by the demolition contractor/subcontractor.

Electrical Hazards Prevention

1. Whiting-Turner requires that all projects are 100% GFCI compliant. An Assured Equipment Grounding Conductor Program may be used in addition to—but not in lieu of—the GFCI program.
2. The installing contractor, i.e. the electrical contractor/subcontractor, shall test each power receptacle for proper installation including polarity, grounding, etc. and forward that documentation to Whiting-Turner

before the circuit is used.

3. The electrical contractor/subcontractor will conduct and document monthly tests after the initial installation.
4. Only round, heavy-duty (type S, SJO, SJTW, ST, SO, STD) extension cords are acceptable for use on a construction site; at least 12 gauge or larger.
5. Damaged cords may only be repaired by a qualified electrician in accordance with manufacturer's requirements for such repairs.
6. Where feasible, all extension cords will be suspended (8') above the floor or working surface.
7. Extension cords shall not be fastened with staples, hung from nails, or suspended with non- insulated wire.
8. All temporary lighting circuits must originate from GFCI protected breakers.
9. Temporary wiring must be rated for all conditions it may be subjected to and be installed as per NEC, OSHA, NFPA and Authorities Having Jurisdiction requirements

Energy Control

1. Lockout/tagout (LOTO) shall not be considered for use until all other avenues of attaining a "zero-energy state" have been exhausted.
2. All contractor/subcontractors working with electrical systems are required to have a written Lockout/tagout procedure. A competent person shall be responsible to control all aspects of the LOTO procedure. They will ensure coordination with the appropriate tradesmen.
3. If a system can be locked out through design or by other means, this will be the preferred method.
4. The lockout device shall be substantial enough to prevent removal.
5. The lock shall be a separately keyed lock for use only with the lockout system.
6. The lockout device must be tagged with the name of the employee and their company. There shall be one lock for each employee (including Whiting-Turner) exposed to the system.
7. The use of 100% LOTO must be maintained until the completion of the task. Verification by all competent persons in charge of the LOTO shall be completed prior to re-energizing the system.
8. In the event an employee is discovered tampering with or violating the LOTO procedure, the employee will be removed from the project indefinitely.
9. A log shall be maintained on site that identifies the following:
    - Date of usage
    - Number of locks and tags used
    - Contractors involved
    - Time of LOTO initiation
    - Time of LOTO removal
    - Designated competent persons
    - Location of LOTO Devices
10. Electrical or piping & instrumentation drawings or identifying specific locations of the LOTO devices shall accompany the LOTO log.

Excavations

1. Prior to the commencement of excavation activities where the excavation will be greater than 3 feet in depth, a pre-excavation checklist must be completed by the contractor/subcontractor's competent person and submitted to Whiting-Turner upon request.
2. Underground utility installations must be identified and marked prior to beginning any excavation. To prevent unintentional contact, all necessary measures must be employed to locate underground utilities prior to excavating. Acceptable methods include but are not limited to the following: test pitting, ground penetrating radar (GPR), use of as-built drawings and any other obtainable information.
3. A competent person must be identified on Whiting-Turner's competent person designation form and their qualifications submitted to Whiting-Turner prior to the start of work.
4. All excavations shall be protected by snow fence, at a minimum.
5. Persons walking or working adjacent to a trench with vertical/shear walls that is equal to or greater than six

(6) feet in depth must be protected from fall hazards unless it has been determined by the competent person that it is infeasible or creates a greater hazard.

6. Persons crossing an excavation that is equal to or greater than six (6) feet in depth must be protected from fall hazards by means of a guardrail system.
7. See Utility Location and Avoidance Policy for additional requirements.

Fall Protection and Prevention

1. Prior to creating a hole or opening in any elevated work surfaces, contractors/subcontractors must submit an elevated surface modification permit.
2. Particle board, medium density fiber board (MDF) or similar material is prohibited from being used as floor hole covers on Whiting-Turner projects All holes must remain properly covered, secured, and labeled / signed.
3. Each contractor/subcontractor, with employees exposed to a fall 6’ or greater to a lower level must ensure that effective fall protection measures and rescue procedures are addressed in their company Activity Hazard Analysis prior to beginning work on site. This is to include the name and qualifications of the designated competent person.
4. A Personal Fall Arrest System (PFAS) [comprised of a full body harness, double lanyards, anchorage point and anchorage connector], a personal fall restraint system (PFRS) [comprised of a full body harness, lanyard, anchorage point and anchorage connector], a guardrail, or safety net system must be in place to protect all trade persons from exposure to falls working at or above 6 feet.
5. Employees working on ladders must be at least one and a half times the height of the ladder away from any perimeter, shaft, stairway, and opening where the fall distance exceeds 6’. If that distance isn’t feasible, a conventional fall protection method must be employed.
6. Stilts are only permitted in broom swept areas, where there is no change in elevation.
7. Every hatchway and chute floor opening shall be guarded by a hinged floor-opening cover. The opening shall be barricaded with railings to leave only one exposed side. The exposed side shall be provided either with a swinging gate or so offset that a person cannot walk into the opening.
8. An extension platform outside a wall opening onto which materials can be hoisted for handling shall have a standard railing that meets handrail standards. However, one side of an extension platform may have removable railings to facilitate handling materials; in this instance a personal fall restraint or arrest system shall be utilized to protect the exposed worker.
9. Perimeter cable shall not be less than 3/8” steel cable.
10. Corner uprights must be braced so that the required tension may be maintained.
11. The cable must be terminated with three U-bolt wire rope clips that maintain an efficiency rating of at least 80% of the wire rope’s breaking strength as proven through product documentation (e.g. Crosby clips).
12. Perimeter cable shall not be used as part of a personal fall arrest or fall restraint system unless designed to be used in that manner by a registered engineer.
13. The use of open turnbuckles as part of the perimeter cable system is prohibited.
14. All guardrail systems [with the exception of scaffold systems or where it can be proven to create a greater hazard] must be equipped with orange perimeter screening or mesh to prevent the ability to breach the system by climbing through rails. The installation of the screening must be compliant with Whiting-Turner’s orange perimeter screening guidelines.
15. A fall restraint system must be employed when working from articulating boom lifts.
16. A PFAS is not required when climbing up or down a ladder. Fall protection shall be considered by the competent person if employees work from a ladder 6’ or more above a lower level and are exposed to a fall.
17. Steel erectors and metal decking installers must utilize 100% fall protection devices at all times when working over 6’.
18. Horizontal lifelines must be designed by an engineer and installed under the supervision of a qualified person. A safety factor of two must be maintained.
19. Adequate fall protection devices must be provided, installed, and used at all loading platforms by the contractor/subcontractor wishing to remove existing perimeter protection prior to its removal.

20. All anchorage points utilized in a personal fall arrest system must be capable of supporting a load of no less than 5000 lbs.
21. Retraining documentation—to include instructor's name and qualifications, training literature and sign-in sheet—must be submitted to Whiting-Turner on company letterhead.

Fire Prevention and Protection

1. A 20 lb. ABC dry chemical fire extinguisher or equivalent must be provided for each 3,000 square feet of protected building area. An extinguisher shall be placed at every stairwell on each level.
2. Residential-like wood framing construction shall have a 20 lb. ABC dry chemical fire extinguisher or equivalent for each 1,500 square feet of protected building area.
3. Storage of flammable/combustible liquids on or inside of buildings under construction shall be no more than one-day supply.
4. Provide a 20-pound ABC dry chemical type extinguisher between 25'-75' from areas where flammable liquids are being handled.

Housekeeping

1. Clean-as-you-go practices are required.
2. Sort and organize material, sweep daily, and standardize activities to aid in the elimination of storage of excess/unused material in active work areas
3. Work that may temporarily block emergency exits, safety showers, elevators, corridors, and hallways will require prior Whiting-Turner approval.
4. Materials stored in the vicinity of the area where work is performed should be limited to only those materials that will be used in the same shift.
5. Any material stored in a work area longer than 24 hours must be approved by Whiting-Turner.
6. Gang boxes, toolboxes, and sea containers/conex boxes shall not have materials stored on top of them.
7. All chemicals brought on site must be approved by Whiting-Turner.
8. The user of the chemical must provide Whiting-Turner an SDS prior to bringing the substance on site.
9. Chemical/gas cylinders (welding, purging, leak detection cylinders, etc.) must be secured.
10. All dedicated chemical storage areas must have safety data sheets (SDS) available at the storage location.

Mobile Elevated Work Platform

1. Employees must keep both feet on the floor of the basket; use of guardrails to gain additional height is prohibited on Whiting-Turner project sites.
2. Where aerial and scissor lifts are used on concrete slabs, any floor depressions or grade changes are required to be barricaded to restrict travel onto that area.
3. The area(s) below the basket or platform of aerial lifts shall be cordoned off using reinforced danger tape—or something of equivalent or greater tensile strength—and by using signage to identify the overhead hazard when a potential for falling objects exists
4. Field modifications are not allowed on aerial lifts. Aerial lifts shall not be used to hoist, raise, or position material outside of the platform or basket unless manufactured to do so.

Personal Protective Equipment

1. Prescription eyeglasses and sunglasses that do not comply with ANSI Z87.1 are prohibited.
2. Aluminum hardhats, and bump caps are not permitted on Whiting-Turner projects.
3. For security and identification purposes, all hardhats shall display the contractor/subcontractor name and/or decal identifying the employer as well as the employee's name.
4. Employees exposed to electrical voltages of 600 V or greater shall wear hardhats that meet the requirements of ANSI Z89.2 type Hardhats
5. Hand protection is required when employee's hands are exposed to hazards such as those from skin absorption of harmful substances, cuts or lacerations, abrasions, punctures, chemical burns, thermal burns, and harmful temperature extremes.

6. High visibility vests/gear are required by each person on site.
7. Long pants and shirts with at least a 4" sleeve is required. Shorts, cut offs, tank tops, and net shirts are not permitted.

Scaffolds

1. Contractor/subcontractor whose employees will need to access a scaffold system for work shall have a competent person present to inspect and sign off on the scaffold prior to the start of work each day.
2. Employees erecting or dismantling a scaffold are required to utilize appropriate fall protection at heights six (6) feet or above unless proven to be infeasible or more hazardous as determined by their company's competent person.
3. All scaffolds, including carpenters' bracket scaffolds, over six (6) feet in height shall have guardrails on all open sides. If guardrails cannot be used on a walking/working platform, contractor/subcontractors are required to use another means to protect employees from a fall.
4. Cross-braces are not considered to be an adequate guardrail (fall protection) system and shall not be used as a top or mid rail on Whiting-Turner projects.
5. Contractors shall utilize a scaffold tag system. The scaffold tag system shall be color coded and visible. The competent person shall inspect the scaffolding system before each work shift. The competent person shall sign and date the scaffold tag.
    - Green tags are reserved for complete systems
    - Red tags are reserved for erection/dismantling activities and for scaffolds with deficiencies in the system
    - Yellow tags are reserved for systems that require the use of both PFAS and guardrail systems for incomplete scaffold systems or platforms.

Signs, Signals and Barricades

1. All caution and danger tape used on Whiting-Turner project sites shall be of the reinforced type and shall be supplemented with a tag/label affixed with the responsible party's name, company, contact number, and potential hazard.
2. All flagmen shall be trained on appropriate procedures before controlling traffic, as required by the Manual on Uniform Traffic Control Devices (MUTCD) and any municipal or state guidelines.
3. All flagmen shall utilize sign paddles and shall be outfitted with high visibility garments, as required by current ANSI standards. All PPE and traffic control equipment shall be outfitted with reflectorized material for night work as required by current ANSI standards.

Stairways and Ladders

All aluminum and commercially manufactured wooden ladders shall not be used on Whiting- Turner projects.

Fall protection shall be considered by the competent person if employees work from a ladder 6' or more above a lower level and are exposed to a fall.

Employees working on ladders must be at least one and a half times the height of the ladder away from any perimeter, shaft, stairway, and opening where the fall distance exceeds 6' without employing additional means of fall protection.

Subcontractors shall provide ladders with duty ratings that meet the needs of their employees. Workers are required to select ladders that are capable of safely supporting their weight and the weight of their tools.

Steel Erection

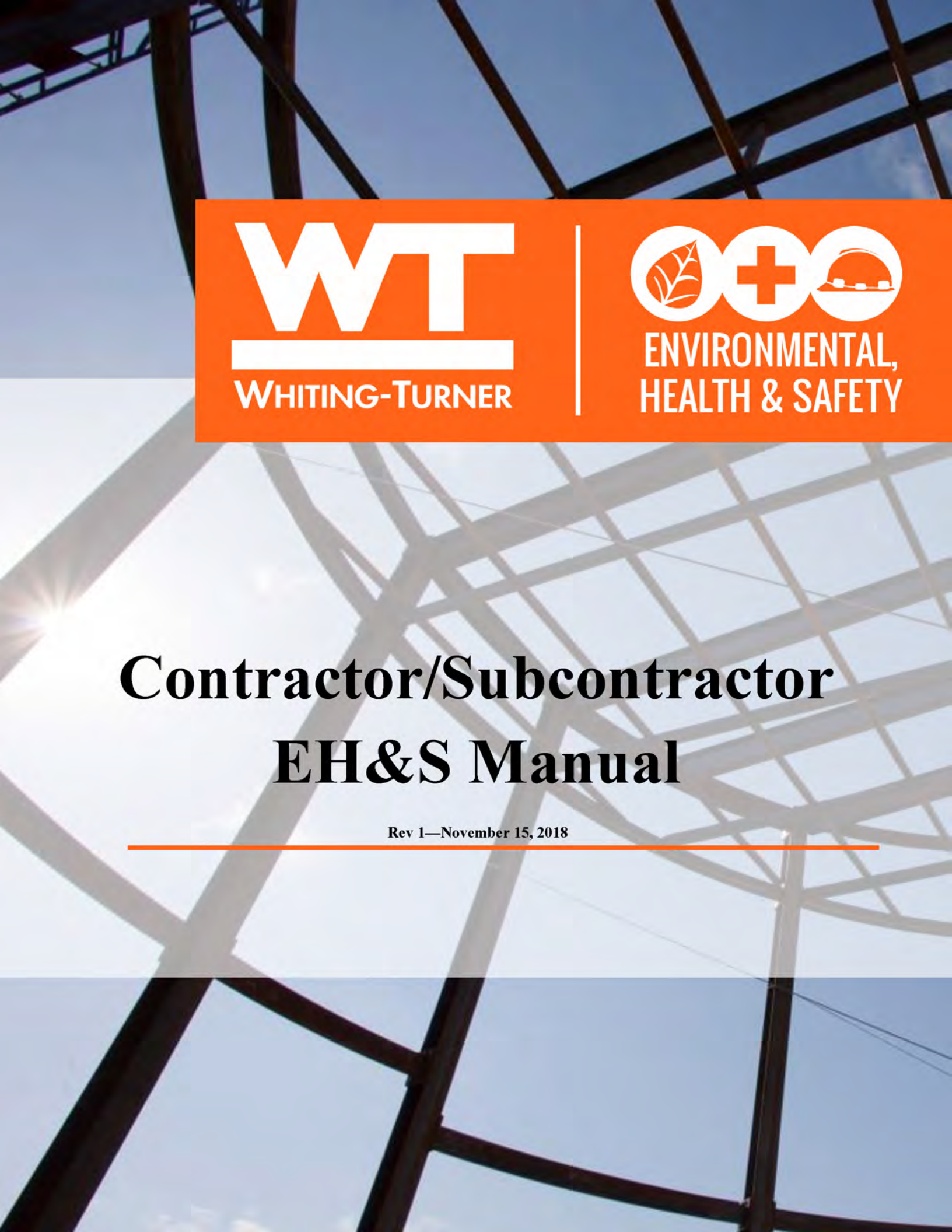
1. Fall protection provided by the steel erector shall remain in the area where steel erection activity has been completed to be used by other trades; if / when Whiting-Turner accepts and takes custody of the system.
2. All tradespersons, including connectors, engaged in steel erection activities on a walking/working surface with an unprotected side or edge more than six (6) feet above a lower level shall be protected from fall hazards by a conventional fall protection method.
3. Roof penetrations are to be made only when equipment is ready to be installed.

4. Safety latches on hooks shall not be disengaged or made inoperable.

Welding and Cutting

1. A Hot Work Permit must be completed daily by each contractor/subcontractor performing all welding, burning/cutting operations.
2. Contractor/subcontractors are responsible for providing a fire watch and a charged, 20lb ABC dry chemical fire extinguisher for each welding and burning activity.
3. A fire watch is always required to remain in place during the hot work activity and for a minimum of one half (1/2) hour after the welding or burning operation has been completed.
4. Additional permits may be required by the local Fire Department and will be at the contractor/subcontractor's expense.
5. All shields shall be compatible with a hardhat.
6. All cylinders shall be considered in storage at the end of each shift; cylinders must have gauges removed and caps in place.

END OF SECTION 01 35 20



Contractor/Subcontractor EH&S Manual

Rev 1—November 15, 2018

Table of Contents

1. **Contractor/Subcontractor EH&S Requirements**

1.1) Blood-borne Pathogen Exposure Prevention Policy

1.2) Carbon Monoxide Exposure Prevention Policy

1.3) Concrete and Masonry Policy

1.4) Confined Space Entry Policy

1.5) Cranes & Derricks Policy

1.5.1) Critical Lifts Policy

1.5.2) Tower Cranes

1.6) Demolition Policy

1.7) Electrical Hazards Prevention Policy

1.8) Energy Control Policy

1.9) Excavations Policy

1.10) Fall Protection and Prevention Policy

1.11) Fire Protection and Prevention Policy

1.12) Hand and Power Tools Policy

1.13) Hazard Communication

1.14) Hexavalent Chromium Exposure Policy

1.15) Housekeeping Policy

1.16) Materials Handling and Rigging Policy

1.17) Medical Services Staffing Policy

1.18) Mobile Elevated Work Platforms

1.19) Motor Vehicles, Mechanized Equipment, and Marine Operations Policy

1.20) Personal Protective Equipment Policy

1.21) Respiratory Protection Policy

1.22) Sanitation Policy

1.23) Scaffolds Policy

1.24) Signs, Signals and Barricades Policy

1.25) Silica Exposure Prevention Policy

1.26) Stairways and Ladders Policy

1.27) Steel Erection Policy

Table of Contents

1.28) Temporary Facilities

1.29) Underground Construction, Caissons, Cofferdams and Compressed Air Policy

1.30) Welding and Cutting Policy

2. **Premobilization Safety Submittals and Ongoing Safety Management**

3. **Compliance Enforcement and Incentive Guidelines**

DISCLAIMER: The information contained in this Manual is not intended to serve as a substitute for the exercise of good engineering judgment by the engineers nor as a substitute for determinations made by contractors/subcontractors of appropriate manner and methods of operations and safety aspects of work under their control. This Manual is also not intended to be all inclusive or replace a contractor's or subcontractor's corporate or site-specific safety program and is not intended to, nor shall it, supersede any more stringent federal, state, local and other applicable laws, codes, rules, regulations, and/or practices. All contractor's and subcontractor's site-specific safety programs must meet or exceed the requirements of the Whiting-Turner EH&S program, the contract documents and all federal, state, local and other applicable laws, codes, rules, regulations, and/or practices. In the event of any conflicts between the material contained therein and any more stringent laws, codes, rules, regulations, and/or practices, the more stringent laws, codes, rules, regulations, and/or practices shall govern.

This Manual and all information contained therein is confidential and intended for the sole use of contractors and subcontractors on Whiting-Turner projects. Contractors/subcontractors are prohibited from distributing this information to any third parties. The Whiting-Turner Contracting Company expressly disclaims warranties for the information contained in this Manual and makes no representations to third parties regarding the reliability, suitability, correctness, or completeness of such information. Whiting-Turner assumes no responsibility or liability and shall not be responsible and/or liable for damages or losses of any kind, including but not limited to direct, indirect, incidental, exemplary, special or consequential damages or losses, arising from, attributable to and/or resulting from the use of such information by third parties however caused and on any theory of liability, whether in contract, strict liability or tort.

Confidential/Copyright by: The Whiting-Turner Contracting Company November 2018

1. Contractor/Subcontractor EH&S Requirements

Policy Statement

The following establishes Whiting-Turner's minimal EH&S requirements for all contractors/ subcontractors on a Whiting-Turner project. This Manual is not meant to be all inclusive and it does not, in any way, excuse the contractor/subcontractor from adhering to the entirety of the Owner's requirements and OSHA's 29 CFR 1926 Safety and Health Guidelines for Construction nor is it a substitute for the contractor/subcontractor's own site-specific safety program. The contractor/subcontractor's own site-specific safety program must meet or exceed the requirements of the Whiting-Turner Contractor/Subcontractor EH&S Manual, the Contract documents and the most current federal, state, local or other applicable codes and regulations.

General Requirements

1. Each contractor/subcontractor must identify and submit the qualifications of a safety representative/competent person to Whiting-Turner as the primary, on-site contact for safety related issues.
    a. The safety representative may be a supervisor and they shall have, at a minimum, the OSHA 30-hour Outreach Training Program for Construction.
    b. The contractor/subcontractor will provide a first aid/CPR trained person when one or more of the contractor/subcontractor's employees are working

2. The contractor/subcontractor's supervisor(s) and safety representative must make frequent and regular inspections of their work areas and activities.
    a. Hazards identified that are under their control must be corrected immediately and all other identified hazards must be reported to the Whiting-Turner Project Superintendent.
    b. One documented inspection shall be conducted each week and made available at Whiting-Turner's request.

3. The contractor/subcontractor's on-site supervisor and the contractor/subcontractor's designated on-site safety representative must schedule and attend a pre-construction safety meeting with the Whiting-Turner Superintendent and Site Safety Manager to discuss the contractor/subcontractor safety requirements.
    a. The pre-construction safety meeting should take place at least five (5) working days before startup to allow for review of required documentation.

4. The contractor/subcontractor shall provide a translator whenever there are non-English speaking workers on site. Subcontractor supervisors must be able to communicate in English.

5. Contractor/subcontractors, who in turn contract out parts of their work, have sole responsibility to see that their lower tier contractors comply with project safety requirements. Additionally, Whiting-Turner's Project Manager and/or Whiting-Turner's Superintendent shall be notified that the lower tier contractors are arriving at least five (5)

days before work starts. The Contractor/subcontractors will be held directly accountable for all lower tier contractors. Contractors/subcontractors must provide a competent person onsite fulltime to oversee and direct lower tier contractors' while actively performing work.

6. The contractor/subcontractor's superintendent(s) and/or designated safety representative must attend the weekly coordination meeting where safety issues will be addressed. Emergencies should be handled through the Whiting-Turner Field Office according to the posted Emergency Action Plan.

7. All work-related injuries, regardless of severity, must be reported to Whiting-Turner immediately. An accident/incident investigation report must be completed by the appropriate contractor/subcontractor supervisor and submitted to the Whiting-Turner project team within 24 hours of the incident. Further, all work-related injuries will be recorded on the injury log. A completed injury log will be submitted to the Whiting-Turner project team by the 5th of the month for the previous month.

8. Incidents involving the general public, regardless of severity, must be reported to Whiting-Turner immediately. An accident/incident investigation report must be completed by the appropriate contractor/subcontractor supervisor and submitted to the Whiting-Turner project team within 24 hours of the incident.

9. Each contractor/subcontractor with chemicals on site shall have a spill kit on the project with the appropriate materials for adequate and prompt clean-up. In addition, their site-specific safety plan shall address spill prevention and containment measures.

10. Only communication radios are permitted on Whiting-Turner projects.

Activity Hazard Analysis (AHA) and Pre-task Planning (PTP)

Activity Hazard Analysis.

For each phase or major type of work/definable feature of work an AHA will be completed to identify the following:

- Health and safety considerations
- Description of steps to be performed
- Hazards associated with each step
- Required action to eliminate or control the hazard
- Focus four hazards and controls
- Contractor/subcontractor supervision sign-off

The AHA is required to be submitted to the Whiting-Turner project team ten (10) days prior to start of the task. The contractor/subcontractor shall not be released to work until the AHA is received by the Whiting-Turner Superintendent or their designee.

Contractors/subcontractors involved in abatement, demolition, steel erection, confined space, and lockout/tagout operations must submit their site-specific safety plan for review by the Whiting-Turner Superintendent or Area EH&S Manager prior to the start of work.

Pre-task Planning.

This daily plan is designed to take place at the start of each work shift. Contractor/subcontractor supervisors are encouraged to meet with their crews to discuss the tasks to be accomplished and the steps that need to take place to work safely. All tradespersons should review and sign the relevant PTP for their assigned work. The main components of the Pre-task Plan will include the following:

- Evaluating the work area
- Potential hazard checklist
- Required actions to eliminate or control the hazard
- Crew sign-off

A copy of the PTP, if used, shall be kept near the work location.

The information the supervisors are relaying to the tradespersons is the same that was developed in the AHA however, the PTP will greater define the plan for that phase of work as it applies to each crew performing the work.

Aerial and Scissor Lifts

Fall protection is required in all aerial on Whiting-Turner projects. Contractor/subcontractor employees shall comply with their company's or project requirements for fall protection when working from a scissor lift. Climbing above the platform of any lift is prohibited; workers observed committing this unsafe act will be removed from the project for a minimum of 3 days—prior to returning to work they must be retrained by their employer. Manufacturer instructions must be followed for movement of any lift.

Chemicals and Other Potentially Hazardous Materials

A copy of the contractor/subcontractor's site-specific Chemical Inventory List and site specific SDS must be submitted to the Whiting-Turner project team and updated as applicable. The chemical inventory list shall be reviewed on a monthly basis by a qualified person. A Project Hazcom Station [containing a hard copy all safety data sheets applicable to the site] will be established and maintained in the Whiting-Turner Project Office. The Whiting-Turner Hazcom Station does not eliminate the need or requirement for the Contractor/subcontractor to establish and maintain a site-specific chemical inventory.

In the event unknown and/or potentially hazardous materials are encountered during construction, that portion of the work will stop, and Whiting-Turner will be notified immediately. Work will not resume until the Whiting-Turner Project Manager, Superintendent, EH&S Manager or third-party administrator authorizes it.

Communication and Compliance

Contractor/subcontractor management personnel is responsible for ensuring that all EH&S principles, policies and procedures are clearly communicated and understood by their respective employees. Managers and supervisors are expected to enforce all requirements uniformly.

All persons working on a Whiting-Turner project are responsible for using safe work practices. In addition, it is expected that each person follows all procedural safeguards and assists in maintaining a safe work environment.

Disciplinary Action

When safety policies and procedural safeguards are violated or frequent involvement in accidents or infractions is revealed, disciplinary action must be considered. The intent of any disciplinary action taken is to convey the severity or potential severity of the infraction and bring about desired safe work practices.

When a person is observed committing an unsafe act, they must be informed by means of a written safety notice and he/she must attend the next scheduled jobsite safety orientation. In addition, employees observed committing unsafe acts while performing a task that exposes them to fall, electrical, caught-in/between or struck-by hazards must be retrained by their employer prior to attending the jobsite orientation and returning to work. At the discretion of Whiting-Turner management, depending on the severity of the violation by a contractor/subcontractor employee, the person may be suspended from the project for an allotted time or removed from the project permanently.

When a contractor/subcontractor implements their own company procedures for safety infractions committed by their employees on a Whiting-Turner job site, the contractor/subcontractor shall notify Whiting-Turner and provide a copy of the notice of infraction and related disciplinary actions to Whiting-Turner.

Drug & Alcohol Testing
All contractors/subcontractors are required to perform testing as required to comply with all owner requirements and Whiting-Turner's policy for a drug free workplace.

Employee Safety Training
A site-specific safety orientation shall be conducted prior to allowing any workers access to the field. All employees completing the orientation will be issued a numbered orientation sticker or badge to be displayed on their person.

- Additional OSHA Construction Standards that require specific training include, but are not limited to:
    - Hazard Communication Training - 29 CFR 1926.1200.
    - Stairway and Ladder Safety Training - 29 CFR 1926.1050.
    - Fall Protection Training - 29 CFR 1926. 503
    - Personal Protective Equipment - 29 CFR 1926.95
    - Scaffold Training - 29 CFR 1926.450

Contractors/subcontractors are responsible for ensuring their employees receive proper training before authorizing them to work on site.

Weekly Safety Meetings

Project workers must attend at least one safety meeting each week. Copies of meeting minutes must be submitted to the Whiting-Turner project team with the Contractor/subcontractor Daily Progress Report for the day the meeting is held. Meeting minutes must indicate the name of the Contractor/subcontractor and date of the meeting. The supervisor(s) and the attendees must sign minutes.

1.1. Bloodborne Pathogen Exposure Prevention

Introduction

This baseline expectation applies to all contractor/subcontractor employees who could be *reasonably anticipated*, as a result of performing job duties, to come in contact with blood and other potentially infectious bodily fluids. Whiting-Turner employees trained and certified in first aid and cardio pulmonary resuscitation (CPR), who might be *reasonably anticipated* to come in contact with bodily fluids also must follow the guidelines set forth in this section.

Procedures

- When dealing with blood or other bodily fluids, Whiting-Turner and contractor/subcontractor employees are required to follow universal precautions. Accordingly, all human blood and other human body fluids are treated as if known to be contaminated with bloodborne infectious diseases.

- Contractors/subcontractors must provide their employees with disposable latex free gloves and one-way resuscitation masks for use in the event of an emergency.

- All certified first aid providers are required to wear disposable latex free gloves and eye protection while performing first aid on an injured individual. If rescue breathing or CPR is performed, a one-way resuscitation mask shall be provided for the protection of the injured and the provider.

- All blood spills shall be immediately contained and cleaned with an anti-viral solution, or by a solution of 5:1 water to bleach. In the event of a serious accident, the Whiting-Turner project team shall contract an outside biohazardous materials firm.

- Any material saturated with blood or other bodily fluid must be considered regulated waste. Discarded band-aids and gauze containing small amounts of blood products are not considered regulated waste. Disposal of all regulated waste must be conducted by an outside biohazardous waste firm or emergency medical personnel.

1.2. Carbon Monoxide Exposure Prevention

Introduction

Carbon monoxide (CO) is a highly-toxic, flammable, non-irritating, tasteless, odorless gas that is slightly lighter than air. CO is one of the most common asphyxiants encountered in the construction industry. CO is produced in copious amounts by internal combustion engines such as automobiles, diesel powered compressors, welding machines, concrete mixers, and forklifts. Some of the common symptoms of carbon monoxide poisoning are shortness of breath, headache, dizziness, muscular weakness, and nausea.

Procedures

- The use of fuel powered engines and tools—which could potentially increase the likelihood of carbon monoxide exposures beyond the permissible exposure limit—are prohibited in poorly ventilated areas on Whiting-Turner projects.

- In enclosed or poorly ventilated spaces tools and equipment shall be powered by electricity, batteries, or compressed air.

- When using fuel powered generators and compressors, place them outside away from air intakes to ensure that the exhaust is not being drawn back indoors.

- All fuel driven equipment being used indoors or in partially enclosed spaces—that does not meet the Final Tier 4 engine requirements—must have scrubbers where carbon monoxide exposure exists.

- Equipment meeting the Final Tier 4 emissions standards are permitted—continuous air monitoring for the concentration of CO is required.

- Where the potential for exposure beyond the permissible exposure limit is probable—using any device that discharges the products of combustion into a work area—the following testing requirements shall be followed:
    - Monitor the work area continuously for the concentration of carbon monoxide,
    - Monitor several different points within the area at the working/breathing heights of employees.
    - Remove the employees from the area when the concentration of carbon monoxide reaches 35 PPM. Supplemental ventilation and reduction or elimination of the source shall be provided to reduce the concentration below 35 PPM before the employees are allowed to resume work in the area.

1.3. Concrete and Masonry

Introduction

Each contractor/subcontractor working on a Whiting-Turner project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart Q – Concrete and Masonry Construction in addition to the following guidelines.

Procedures

General requirements.

- No construction load may be placed on a concrete structure unless a qualified person, knowledgeable in structural design, determines that the structure is capable of supporting the load.
- Protruding reinforced steel—and similar protrusions—onto or into which employees could fall, must be protected and maintained by the creating contractor to eliminate the hazard of impalement.
- Contractors/subcontractors whose work involves working at heights 6 feet or above a lower level must submit a fall protection and rescue procedures to Whiting-Turner, including the name and qualifications of the designated competent person.
- Eyewash stations and washing facilities must be provided per 29 CFR 1926.50(g) and 29 CFR 1926.51(f)(1), respectively.
- Ensure that proper concrete washout stations are provided and maintained to prevent runoff of liquids and to consolidate solids for disposal.

Equipment and tool requirements.

- Powered and rotating concrete troweling machines must have a "dead man" switch that automatically shuts off power whenever the hands of the operator are removed from the machine.
- Masonry saws must be provided with a semi-circular guard.
- Machines and equipment must be locked and tagged out of service before employees can perform any maintenance or repair work.

Cast-in-place concrete requirements.

- Formwork must be designed, fabricated, erected, supported, braced, and maintained so it can support all anticipated lateral and vertical loads.
- All shoring equipment must be inspected prior to erection to determine if it meets the requirements specified in the formwork drawings.
- Erected shoring equipment must be inspected immediately prior to, during, and after concrete placement.
- Wherever single post shores are used on top of one another a qualified designer must prepare the design of the shoring and an engineer qualified in structural design must inspect the erected shoring prior to concrete placement. Written documentation must be provided to Whiting-Turner prior to the start of the pour.
- Forms and shores shall not be removed until the employer determines that the concrete has gained sufficient strength.

- Fall protection shall be maintained while employees are climbing rebar including point to point movement anytime they are exposed to falls six (6) feet or greater.
- Fall protection is required on all decks where gaps or voids exist in the decking 10" or greater. At the building's perimeter where the decking steps down to allow for a beam pour, the height of the rails shall be increased accordingly to ensure that guardrail protection remains adequate for persons working on the deck.
- Areas where form stripping is to be performed must be properly barricaded with tape or fence and signage must be posted on all sides. This should include areas below stripping.
- Protruding nails in stripped lumber shall be removed or bent immediately.
- Outrigger platforms used for material movement in and out of the building via a crane or forklift must be designed by an engineer and incorporate 100% fall protection systems. Workers using the platform must utilize PFAS if any guardrail is removed.

Concrete forms, falsework, and vertical shoring.

- The concrete contractor/subcontractor shall install guardrails along all perimeter edges and interior floor openings.
    - The installation of the perimeter guardrail system must progress as the leading-edge progresses forward.
    - Proper guardrail heights shall be maintained during the formwork phase and again after the concrete has been placed; the proper top-rail height is between 39"-45" above the walking/working surface and the mid-rail is half that distance.
    - If at any time a worker breaches the height of a guardrail system, that worker shall be protected by a personal fall arrest system or a tiered guardrail system that provides adequate protection.
        1. If the distance from a person's walking/working surface and the top-rail is less than 39 inches, that person has breached the fall protection system and another method of protection must be employed.
        2. Likewise, if the distance from a person's walking/working surface and the top-rail exceeds 45 inches, that person is considered to have inadequate protection and another method of protection must be employed.

Masonry requirements.

- A limited access zone must be established prior to the start of any masonry work.
- The zone must be equal to the height of the wall, plus four feet.
- Employees that are working at heights greater than six (6) feet and are reaching more than 10 inches below the level of the walking / working surface on which they are working, must be protected from falling by personal fall arrest systems.
- For overhand bricklaying from a scaffold, fall protection is required if the working side of the scaffold has a gap greater than 14" between the scaffold and structure.

1.4. Confined Spaces

Introduction

No Whiting-Turner or contractor/subcontractor employee shall enter into any type of confined space until it has been identified and labeled by their respective employer's competent person and all applicable safety requirements contained in 29 CFR 1926 Subpart AA – Confined Spaces in Construction and this section have been met. All contractors/subcontractors involved in confined space activities shall submit a program—which meets or exceeds all federal, state and local regulations as well as the directives contained herein—to Whiting-Turner prior to the commencement of work in said spaces.

Procedures

General.

All confined spaces, regardless of classification, shall have continuous multi-gas/4-gas air monitoring while the space is occupied by tradespersons. Atmospheric testing shall also be performed prior to persons entering the space.

Pre-entry assessment.

Prior to confined space entry, each employer must ensure that a competent person identifies all confined spaces in which one or more of the employees it directs may work, identifies each space that is a permit space, through consideration and evaluation of the elements of that space, including testing.

It is Whiting-Turner's position that all confined spaces are permit required until proven otherwise [in writing] by the contractor/subcontractor's competent person. Depending upon the type of confined space identified, specific criteria must be satisfied before entry.

Signage.

All confined spaces shall be labeled. If the workplace contains permit spaces, the entry supervisor shall inform employees by posting danger signs at all entrances of confined spaces. The signs will be legible in English and in the predominant language of non-English reading workers. At a minimum, the following information will be included:

DANGER
PERMIT-REQUIRED CONFINED SPACE
DO NOT ENTER

Authorized entry.

If permit spaces exist in the workplace, only authorized employees may enter the spaces. The entry supervisor shall take effective measures to prevent unauthorized employees from entering into permit spaces. No work will be permitted in confined spaces until the contractor/subcontractor has initiated, maintained, completed, and posted a permit accepted by a designated Whiting-Turner employee.

Modification of non-permit spaces.

If non-permit spaces are modified, or experience any change that causes an increased hazard to entrants, the supervisor of the exposed employees, shall ensure that the space is reevaluated by the competent person.

Permit required spaces.

If permit spaces are identified, the following program elements, at a minimum, must be addressed in a written project specific confined space procedure.

- Environmental Controls – to ensure that pre-entry precautions (i.e. hazard evaluations, operating procedures, isolation methods, safety equipment, etc.) have been implemented.
- Atmospheric Testing – for oxygen content, explosive vapors, toxic substances and carbon monoxide to ensure that acceptable entry conditions exist.
- Assigned Duties – of each participant must be established and clearly communicated.
- Rescue Equipment and Emergency Services – develop and implement procedures for summoning rescue and emergency services, for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees and for preventing unauthorized personnel from attempting a rescue.
- Entry Permit System – used to record critical data and serve as official entry authorization must be implemented and managed accordingly following the completion of permit space work.
- Training – of employees expected to enter permit required confined spaces must be provided to ensure that understanding of assigned duties and the requirements of 29 CFR 1926.1207.
- Medical Surveillance Program – for all employees who must enter permit spaces shall be established to ensure that they have been medically evaluated and cleared to work in such spaces.

1.5. Cranes and Derricks

Introduction

Each contractor working on a Whiting-Turner project will comply with 29 CFR 1926 Subpart CC – Cranes & Derricks in Construction in addition to the following guidelines.

Procedures

General requirements.

- No crane or hoist shall be placed in service on a Whiting-Turner project until an annual, third party inspection and supplemental reports are submitted to the Whiting-Turner project team indicating that the crane or hoist meets the manufacturer's inspection criteria.
- If the manufacturer's inspection criterion does not exist, a structural engineer, familiar with crane or hoist's design and dynamics, may develop or use existing inspection criteria.
- Whiting-Turner requires all crane operators to be certified or qualified in accordance with the requirements of Subpart CC.
    - Copies of all certifications shall be submitted to the Whiting-Turner project team prior to the start of work.
    - A certified operator license must be provided where state or local ordinances require additional certifications.
- Mobile crane movement on site must be in accordance with manufacturer's recommendations.
- The swing radius of cranes must be properly barricaded at all times while working on site.
- Wire rope, its attachments, fittings, sheaves, and safety devices must be inspected according to the manufacturer's recommendations. Copies of the inspections must be submitted to the Whiting-Turner project team.
- Wedge sockets and fittings must be the proper size to match the wire rope and must not move when holding the wire rope under load. The dead end must be terminated according to ANSI B30.5 and must not be attached, in any manner, to the live side of the load line.
- An anti-two-block or warning device is required on all cranes except those engaged in driving piles.
- A qualified rigger must inspect the rigging prior to each lift.
- All windows in cabs must be safety glass that produces no visible distortion that will interfere with the safe operation of the machine.
- Outriggers shall be fully extended unless proven to be a hindrance to the safe operation of the crane or infeasible by the operator. In all cases, the use intermediate outriggers may only be considered if it is permitted by the manufacturer.
- Whiting-Turner's crane checklist shall be completed prior to each initial lift.

Lift plans.

- All pick & place lifts—excluding standard deliveries—requires a formal lift plan.
  - This plan must be submitted to the Whiting-Turner project team for record and review prior to the commencement of the lift.
  - Whiting-Turner personnel shall not approve lift plans; however, Whiting-Turner reserves the right to reject lift plans or require additional information if deemed necessary.
- All completed documentation with reference to the lift—including Whiting-Turner Crane Authorization Form—shall be onsite prior to beginning and for the duration of the activity.

Ground conditions.

- Unless otherwise agreed upon, the Whiting-Turner Superintendent must ensure that appropriate ground preparations are provided—firm, drained and graded.
- The agreement of acceptable ground conditions and notification of known underground hazards shall be considered completed once the competent persons have signed the Whiting-Turner Crane Authorization Form.

Controlling loads.

- All loads to be lifted at Whiting-Turner project sites shall have a tag line attached.
  - The competent person shall determine the size, rope materials, and length of the tag line.
  - The line shall be attached in a way that maintains control of the load to reduce the risk of caught-in/-between and struck-by hazards to employees and surroundings during any lift.
  - Where encroachment precautions are required, taglines must be of nonconductive material.

Assembly/disassembly.

- Manufacturer
  - When assembling or disassembling equipment (or attachments), the contractor shall comply with all applicable manufacturer exclusions and procedures for assembly or disassembly.
- General Requirements
  - Assembly/disassembly must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons.

Power line safety. (Up to 350 kV)

- Equipment Operations
  - Before beginning equipment operations, the employer must identify the work zone.
  - If during the operations any part of the equipment will get closer than 20 feet to a power line, the employer must ensure that (a) The power line is de-energized and visibly grounded at the worksite, (b) No part of the equipment gets closer

than 20 feet to the power line; or (c) A table in the standard is used to determine the minimum safe distance based on the line's voltage.

Inspections.

- Copies of all required inspections completed shall be submitted to the Whiting-Turner project team after completion of the inspection for record at the project site.
- Inspections are required during the following intervals and specifications
    - Modified equipment – Modified equipment must be inspected by a qualified person after the modifications have been completed, but prior to initial use.
    - Repaired and Adjusted Equipment – Repaired and adjusted equipment must be inspected by a qualified person after the repairs or adjustments have been completed, but prior to initial use.
    - Post Assembly – Upon completion of assembly, a qualified person must inspect the equipment to assure that it is configured in accordance with manufacturer equipment criteria.
    - Post Assembly – a post assembly inspection is required for all Crawlers and Tower Cranes by a person properly trained and qualified to inspect such equipment.
    - Each Shift – A competent person must begin a visual inspection prior to each shift the equipment will be used, which must be completed before or during that shift.
    - Monthly – Each month that the equipment is in service it must be inspected in accordance with the criteria established in the standard.
    - Annual Comprehensive – At least every 12 months the equipment must be inspected by a qualified person in accordance with the criteria established in the standard.
    - Severe Service – When the equipment is used enough that there is a reasonable possibility of damage or excessive wear the employer must stop using the equipment and have it inspected by a qualified person using the inspection criteria established in the standard.
    - Equipment Not in Regular Use – Equipment that has been idle for three (3) months or more must be inspected by a qualified person using the inspection criteria established in the standard.
- Any crane with a deficiency that could potentially affect the safe operation of the equipment shall be taken out of service immediately and remain so until documented repairs have been made.

Safety devices.

- The following safety devices are required on all equipment unless otherwise specified in 29 CFR 1926 Subpart CC:
    - Crane level indicator
    - Boom stops (except for derricks and hydraulic booms)
    - Jib stops (if jib is attached)
    - Locks on equipment with foot pedal brakes

- Integral holding device/check valves on hydraulic outrigger jacks and hydraulic stabilizer jacks
- Rail clamps and rail stops on equipment on rails (except for portal cranes)
- Horn
- Boom-tip anemometer or equivalent device

Operations.

- Contractors must comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.

Authority to stop operation.

- Whenever there is a concern about safety, the operator has the authority to stop and refuse to handle loads until a qualified person has determined that the safety concern has been resolved.

Signals.

- A signal person must be provided in each of the following situations:
  - When the point of operation is not in full view of the operator
  - When the view in the direction of travel is obstructed when the equipment is traveling
  - When site specific safety concerns are an issue because either the operator or the person handling the load determines that it is necessary.
- Types of Signals
  - Signals to operators must be by hand, voice, audible, or new signals.
  - Whiting-Turner prohibits the use of cell phones for signaling of cranes and equipment
- Suitability – The signals used and means of transmitting them must be appropriate for the site conditions.
- During Operations – During the operations the ability to transmit signals must be maintained. If that ability is interrupted the operator must safely stop all operations until the ability to transmit is re-established and a proper signal is given and understood.
- Safety Problems - If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator must safely stop all operations.
- The operations must not resume until the operator and signal person agree that the problem has been resolved.
- Only One Signaler - Only one person may give signals to a crane or derrick at a time, except for those giving the emergency stop signal.
- Safety Problems Alert - Anyone who becomes aware of a safety problem must alert the operator or signal person by giving the stop or emergency stop signal.
- Communication with Multiple Cranes/Derricks - Where a signal person is in communication with more than one crane/derrick, a system must be used for identifying the crane/derrick each signal is for as follows:
  - For each signal, prior to giving the function/direction, the signal person must identify the crane/derrick the signal is for or must use an equally effective method of identifying which crane/derrick for which the signal is intended.

- Testing Signal Transmission Devices - The devices used to transmit signals must be tested on site before beginning operations to ensure that the signal transmission is effective, clear, and reliable.
- Dedicated Channels - Signal transmission must be through a dedicated channel, except:
    - Multiple cranes/derricks or more than one signal person may share a dedicated channel for coordinating operations; and
    - Where a crane is being operated on or adjacent to railroad tracks, and the actions of the crane operator need to be coordinated with the movement of other equipment or trains on the same/or adjacent tracks.
- Language - The operator, signal person and lift director (if applicable), must be able to effectively communicate in the language used.

Work area control.

- Swing radius hazards – Workers must be protected from foreseeable risks of being struck by and/or pinched or crushed by the equipment's rotating superstructure.
- Training – Affected tradespersons must be trained to recognize struck by and pinch/crush hazard areas posed by the rotating superstructure.
- Barriers – Control lines, warning lines, railings or similar barriers must be erected to mark the boundaries of the hazardous areas. All barriers must be equipped with a warning sign (such as “danger-swing/crush zone”).
- Protecting tradespersons in the hazard area – Before a worker goes to a location in the hazard area that is out of the view of the operator, the worker (or someone instructed by the worker) must ensure that the operator is informed that he/she is going to that location.

Keeping clear of the load.

- Hoisting routes - Where available, hoisting routes that minimize the exposure of tradespersons to hoisted loads must be used.
- Workers in fall zone - While the operator is not moving a suspended load, no worker must be within the fall zone except for the following:
    - Workers engaged in hooking, unhooking, or guiding a load
    - Workers engaged in the initial attachment of the load to a component or structure
    - Workers operating a concrete hopper or concrete bucket

Safety criteria for tradespersons in fall zone.

When affected tradespersons must be in the fall zone the following criteria must be met:

- The materials being hoisted must be rigged to prevent unintentional displacement.
- Hooks with self-closing latches or its equivalent must be used.
- A qualified rigger must do the rigging.

Safety criteria for lifting over occupied buildings.

Every reasonable effort should be made to avoid lifting over an occupied building. In cases where the competent person for this operation has determined that a lift over an occupied building is necessary and other options are infeasible, the following criteria must be met:

- Prior to the lift, the area of the top two floors that is within the fall zone shall be evacuated
  - If the contractor's/subcontractor's qualified, competent person determines it—after a thorough hazard assessment—that evacuation is not necessary, this decision shall be submitted to the Whiting-Turner project team be in writing. In addition, the contractor's/subcontractor's competent person must ensure that the critical lift protocols are followed.
- All affected paths of access and egress must be barricaded to prevent access to the restricted area or fall zone
- Signage notifying occupants of the activity and their new path of travel shall be conspicuously posted.

Safety criteria for receiving a load.

Only tradespersons receiving the load can be within the fall zone when the load is being landed.

Safety criteria for tilt up or tilt down operations.

During tilt up or tilt down operations the following criteria apply:

- No worker may be directly under the load.
- Only tradespersons essential to the operation can be in the fall zone but may not be directly under the load.

Workers essential to the operation.

Workers are essential to the operation only if the following apply:

- It is infeasible for the worker to perform the operation from outside the fall zone and;
- The worker is physically guiding the load; or
- The worker is closely monitoring and giving instructions regarding the loads movement; or
- The worker must detach the load or initially attach the load to another component or structure.

Operator qualification and certification.

- Qualification or certification - The employer must ensure that the operator is qualified or certified in accordance with the standard. Employer options for getting affected operators qualified or certified follow:
  - Certification by an accredited crane operator testing organization;
  - Qualification by an audited employer program;
  - Qualification by the U.S. military; or
  - Licensing by a government entity.
- Exceptions to qualification and certification requirements - Operators of derricks, side-boom cranes, or equipment with a maximum manufacturer-rated hoisting/lifting capacity of 2,000 pounds or less are exempt from qualification and certification requirements.

Signal person qualifications.

- Qualification Requirements - The employer must ensure that signal persons meet the following qualification requirements before giving any signals to operators:
    - Obtain documentation from a third party qualified evaluator showing that the signal person meets the qualification requirements established in the standard; or
    - Obtain documentation from the employer's qualified evaluator (not a third party) showing that the signal person meets the qualification requirements established in the standard.
- Documentation Availability - The employer must make signaler qualification documentation available at the site where the signal person is employed.
- Knowledge Requirements - Each signal person must demonstrate the following:
    - Knowledge and understanding of the type of signals used. If hand signals are used, the signal person must know and understand the Standard Method for hand signals;
    - Competence in the application of the types of signals used;
    - Basic understanding of the equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads;
    - Knowledge and understanding of the relevant requirements of the standard covered in the sections on Signals-General Requirements, Signals - Hand Signal Chart, and Signal Person Qualifications; and
    - That he or she meets the qualification requirements through successful completion of an oral or written test and a practical test.

Qualifications of maintenance & repair employees.

- Maintenance, inspection, and repair personnel are permitted to operate the equipment only where specified requirements are met as established in the standard.

Hoisting personnel.

- Personnel hoisting requirements - The use of equipment to hoist personnel is prohibited unless the employer can demonstrate that other methods would be more hazardous and is able to comply with the personnel hoisting requirements that are established in the standard.
- Hoisting personnel on Whiting-Turner project sites shall be done only after review of the plan and deemed feasible by Vice President and the Area EH&S Manager assigned to the project.
- Hoisting personnel on Whiting-Turner projects shall be considered a critical lift or activity, and therefore shall meet all requirements of a critical lift before the lift may begin.

1.5.1 Critical Lifts

Introduction

The goal of this section is to assure that crane lifts which meet the criteria stated below are done with understanding of the regulatory requirements as well stated guidelines contained herein.

The Whiting-Turner Contracting Company identifies a critical or special lift as

- any lift where the total weight of the load and the deductions for the equipment combined exceeds 75% of the capacity of the crane capacity chart at the specific boom length and radius of the load,
- any lift where there will be more than one (1) crane or piece of load handling equipment attached to the load at a time;
- any lift that involves the lifting of personnel;
- any lift where the contents of the lift are considered hazardous to health or environment, and an accidental release could result harm to either;
- any lift where encroachments precautions are required for power lines.

Lift Plan Development

The load.

- Identify loads weight, center of gravity, and dimensions, and the sources of that information.
- Identify any components that could shift during the lift and develop a method to secure any items identified if required.
- Identify load attachment points and assure they are suitable for the load to be handled, while maintaining load integrity.
- Identify the requirements to be met for the loads orientation and securement prior to the release of the load handling equipment and rigging.

Load handling equipment.

- Identify the load handling equipment and the anticipated configuration(s).
- Assure the load handling equipment can handle the total anticipated load, including the rigging, accessories, and attachments in the intended configuration(s).
- Ensure the load handling equipment is in compliance with the requirements of the site, the manufacturer or qualified person, industry-recognized standard, local, state, and federal regulations.
- Establish the process to setup, erect, or install, and dismantle the load handling equipment using the information provided by the following:
    - The manufacturer
    - A qualified person
    - Site specific recommendations
    - Applicable regulatory requirements
- Identify all required inspections and tests on the load handling equipment that need to be performed. Additional inspections may be necessary for repetitive critical lifts.

Rigging.

- Establish rigging method that will support and secure the load and is suitable for the activity.
- Ensure that the rigging method and the equipment have the capacity to support the load in the configuration or geometry required by considering the following:
  - Dynamic Effects
  - Adverse environmental conditions, temperature, wind, lightning etc.
  - Position of the center of gravity relative to rigging support points
  - D/d ratio
- Identify the weight of the rigging, accessories, and attachments, as well the sources of that information
- Establish the process to ensure that rigging equipment meets the manufacturer's specifications, regulations, and industry-recognized standards (e.g. ASME B30.9, B30.20, and B30.26) and onsite requirements.
- Identify all necessary inspections and tests for the rigging equipment and that they are carried out prior to the lift
- For repetitive lifts ensure a more frequent inspection process is in place.
- Establish the process to install and disassemble the rigging equipment using the manufacturers' information and other applicable standards.
- Ensure that the rigging will be protected from damage during the activity.

The travel path.

- Identify the path of travel for the load and the load handling equipment
- Establish a process to minimize the exposure to overhead loads by way of barricades, spotters, or lookouts to ensure only authorized personnel are allowed into the fall zone
- Ensure the load and the load handling equipment has adequate clearance to prevent contact with site-specific hazards or obstructions during the activity
- Ensure a tagline of proper type and length is obtained for load control
- Ensure that the path taken if pick and carry operation is instituted that level and substantial support are established.

Personnel.

- Identify the tasks to be completed prior to, during, and after the load handling activity, and the personnel required to complete each task.
- Identify the specialized training required for these tasks and ensure copies of these training completion documents are attached to the plan.

Site, services, and ancillary equipment.

- Identify the equipment necessary to assist the load handling operation, (high reach, personnel lift, boom lift etc.)
- Identify and ensure specialized training is completed and copies of the completion are attached to the lift plan if required.
- Ensure that ground conditions for equipment support and that proper all underground hazards and placement have been identified and marked for adequate clearance.

- Ensure that all equipment is used and operated in accordance with manufacturer, regulatory and industry standards.

Communication system.

- Identify the suitable communication system to be used during the activity. Acceptable methods for Whiting-Turner project sites are:
  - Voice or radio signals
  - Hand signals
  - Other methods of signals are available but would require review prior to being permitted in respect to effectiveness and applicability.
- Identify back up system to be used in the event of interruption from initial communication system plans

Site control.

- Identify vehicular and pedestrian access and traffic controls to be used.
- Ensure the plan addresses the following:
  - Vehicular and pedestrian traffic in and around the site that could potentially be affected by the load handling activity
  - Potential interference for other site activities and the controls to used
  - Location of barricades or other measures which may be put in place to restrict traffic or prohibit interference during the load handling activity

Contingency considerations.

- The plan should address, at minimum, the following potential events that could cause deviation from the original lift plan:
  - Equipment malfunction or loss of power (e.g. loss of power, fouled rigging, radio communication failure etc.)
  - Adverse changes to the environment (weather, visibility)
  - Deviation from the planned load characteristics identified
  - Adverse changes to the site conditions (surrounding activities, change in ground conditions, and unauthorized entry to the fall zone).

Emergency action plan.

- Review the existing Emergency Action Plan and coordinate modifications created by the load handling activity if applicable.

Pre-lift meeting.

The lift director shall conduct the meeting and the Whiting-Turner supervisor in charge of the operation or other designated person from Whiting-Turner shall attend the meeting along with all associated personnel to the lift.

- At a minimum, the following elements should be reviewed with all load handling activity personnel:
  - Overview of the load handling activity
  - LHE, rigging, and other equipment involved in the load handling activity

  - The sequence of events and step-by-step procedures for the entire load handling activity
  - Safety measures, as required (e.g. work task plan action items)
  - Load handling activity personnel assignments, addressing
    1. Individual responsibilities (e.g. location, time, task)
    2. Work location hazards (e.g. pinch points)
    3. Communication methods
    4. Personal protective equipment requirements
    5. Qualification(s) of assigned personnel
- Concern raised during this meeting shall be addressed prior to proceeding with the load handling activity
- At the completion of the pre-lift meeting, the lift director should confirm that the attendees understand the plan and respective roles and responsibilities during the load handling activity
- For repetitive lifts, the lift director should decide the frequency of pre-lift meetings. Pre-lift meetings are not required prior to each repetition of the load handling activity.

Executing the critical lift plan.

- Preparation for the load handling activity - the lift director should confirm that all setup and preparation requirements of the plan are in place and all required inspections and tests on the LHE(s) and rigging equipment have been completed.
- Initiating the Load Handling Activity - immediately prior to performing the load handling activity, the lift director should ensure that either:
  - All requirements of the plan continue to be met and no conditions exist that would preclude implementation of the plan; or
  - If a deviation exists, the load handling activity is not initiated until the deviation is addressed by a qualified person or the lift director determines that conditions are acceptable to allow the activity to begin.
- During the Load Handling Activity - the lift director should ensure that the load handling activity continues to comply with the plan.
  - If the operation deviates from the plan, the load handling activity should be stopped and evaluated to determine if
    1. The load handling activity can resume according to plan;
    2. The contingency measures can be implemented
    3. The plan can be readily modified at the site to accommodate an unexpected condition or event; or
    4. The load handling activity can no longer be implemented a planned, requiring a modified plan to be prepared. In such case, the load and the LHE shall be secured, if possible, until a new plan can be developed
    5. Changes or modifications to the plan should be communicated to all affected load handling personnel prior to initiating the change.
    6. If the load handling activity is stopped for any reason, only the lift director may initiate restart.
- After the completion of the load handling activity, the lift director should

  - Review the development, planning, and execution of the load handling activity with the load handling personnel. Items for review should include, but not be limited to, the requirements of all previous sections.
  - Identify potential measures to improve future load handling activity
  - Communicate any recommendations identified during the activity to the appropriate personnel for future considerations
- For repetitive lifts, decide the frequency of post-lift reviews and evaluation of the lift plan. Post-lift reviews may not be required after each repetitions of the load handling activity.

1.5.2 Tower Cranes

Introduction

Certain projects, due to size and scope, require the use of tower cranes. The quantity and location of towers cranes will vary from project to project. In some cases, due to project requirements, multiple tower cranes may be in a manner resulting in an overlapping operating zone (i.e. area where the operating zone or radius of working jib intersects the operating zone of another tower crane). While this will increase the hook access across the working deck and enhance the effectiveness of each crane, it brings with it significant safety concerns. For that reason, Whiting-Turner has established the following guidelines. In addition, notice to the Federal Aviation Administration (FAA) guidelines set forth in 14 CFR—Aeronautics and Space, Part 77—Safe, Efficient Use, and Preservation of Navigable Airspace, must be adhered to.

Procedures

Employers using tower cranes must comply with specific provisions in the standard that cover the following subjects:

- Erecting, Climbing and Dismantling
- Signs
- Safety Devices
- Operational Aids
- Inspections

Overlapping operating zones.

Multiple tower cranes operating with an overlapping operating zone have the potential to come into contact with each other. Such an occurrence has the potential to cause damage to the crane and/or its components; cause the crane or cranes to fail and topple; and/or cause severe injury and even death to tradespersons and/or the public. The safe operation of multiple tower cranes with an overlapping operating zone is determined by the communication and coordination of experienced and skilled operators. Nevertheless, by taking a proactive approach to safety and risk management, there is an opportunity to promote safe crane operations and minimize the potential for crane related accidents resulting from overlapping operating zones.

Written operating procedures must be developed and implemented to coordinate lifting tasks in the overlapping operating zone to prevent contact, collision, or interference between a component or suspended load of one crane with a component or suspended load of another crane. The following safety procedures / protocols should be considered if a project has multiple tower cranes with an overlapping operating zone to minimize, if not eliminate, the potential for contact/collision between cranes.

- Establish a means and protocol for communicating between the crane operators when a crane operates in the overlapping zone. Communicating protocols may include the following:
    - Crane operators must have the ability to communicate to each other (via radio - same channel)

  - Reduce distracting background noise on radios by ensuring crane operators, monitor, and limited riggers have separate radio channels
- Include protocols that all crane operators must follow before entering another crane's operating zone. Consider including the following:
  - Visually ensure it is safe to enter the other crane's operating zone
  - Communicate entry intent into that zone to the other operator
  - Receive an acknowledgement response from the other operator. If the entering operator does not receive acknowledgement from the other operator than the entering operator must not proceed with entering the other operator's operating zone
- Standardize the language used for all communication between crane operators (English)
- Consider limiting the number of individuals that can communicate directly with the operators (i.e. individuals on the working deck or other requesting use or support of the crane, etc.)
- Establish clearance requirements for loads passing over or near another tower crane
- Proximity alarms must be utilized to decrease the potential for tower crane contact/collision. Various zone protection and boundary protection safety systems exist in the marketplace (e.g. TAC-3000 Tower Crane Collision / Accident Avoidance Safety System)
- Consider creating a 'right-of-way' procedure giving one crane priority for working in the overlapping operating zone.
- Consider assigning a monitor to observe / supervise all crane activity and provide that monitor with the ability to stop all crane activity should violations of protocol occur, or potentially hazardous situations be observed. The following elements / activities should be considered related to use of said monitor:
  - Monitor shall be equipped with radio to communicate with all crane operators
  - Demonstrate bright, highly visible outerwear unique to the monitor so to be easily distinguishable to the operators and other tradespersons (e.g. bright colored vest and/or hardhat, etc.).
  - Monitor shall be solely dedicated to its role as monitor and shall not participate in any other activities on the project while acting as monitor
  - Monitor shall observe crane activity to ensure that proper protocol is followed
  - Monitor shall listen to communication between operators to ensure that protocol is followed:
  - If operators fail to communicate with each other as protocol requires, the monitor shall issue a reminder to the operators requiring compliance to protocol
  - Monitor shall record instances when operators fail to comply with protocol and inquire why the violation took place
  - Violations in protocol should be copied to the appropriate supervisor / Superintendent and safety personnel of the responsible trade. Documentation shall also be made available to Whiting-Turner
  - Monitor should have the ability to stop crane activity if required to maintain safe crane operations. Methods for delivering an "ALL STOP" directive may include the following:

1. Outfit monitor with air horn to be used to alert a stop directive to operators. Test procedure in field to identify most effective method for communicating signal to operators.
2. Outfit monitor and operators with a separate and dedicated radio to deliver the stop directive. The separate radio is reserved for stop directive between monitor and operators only and would ensure that operators receive directive.

- Monitor shall be a competent person and subject to Whiting-Turner approval

- Help to better identify the counter deck of the lower crane by installing bright flags or other markings on the back of the counter deck.
- Identify counter deck radius of lower crane on the current working deck by means of flags, cones, or other clear delineators to be conspicuously visible. Confirm that delineators are clearly visible to operators and other crane related personnel.
- Formal overlapping operating zone plan shall be distributed to and acknowledged by the responsible contractor's Superintendents, foremen, operators, monitor(s), and safety personnel – at a minimum.
- Disciplinary procedures to address violations in protocol, etc. should be included.
    - Appropriate disciplinary procedures should be identified and implemented on the responsible party if crane contact or associated accident, etc. takes place (e.g. removal of operator or responsible party from the project).
    - Responsible trade shall identify how it will determine who the responsible party is should an occurrence take place requiring disciplinary action.
    - Whiting-Turner shall be copied on all recorded non-conformances with protocol as well as related disciplinary procedures/actions.
- If it is determined that only one tower crane is needed for a given activity or shift of work, the overlapping work zone plan must address the crane that is not in use to avoid interference with the working crane. Procedures for this situation may include the following:
    - If the non-working crane is the higher crane it can be allowed to weathervane and the working crane (lower) can work unobstructed.
    - If the non-working crane is the lower crane:
        1. Non-working crane shall be operated, but not used, to keep non-working crane from *weathervaning* or movement of the non-working crane into the working crane's operating zone.
        2. Investigate to determine whether the non-working crane is outfitted with a locking mechanism to keep the crane from *weathervaning* except under extreme weather conditions. If this is the case, the non-working crane can be locked to prevent *weathervaning* into the working crane's operating zone. At certain wind speeds (determined by crane manufacturer) the lockdown function will be overridden, and the non-working crane will be allowed to weathervane. Weather conditions and wind speed causing this override will require all crane activity to stop in this scenario.

1.6. Demolition

Introduction

Each contractor/subcontractor performing demolition on a Whiting-Turner project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart T – Demolition, in addition to the following guidelines.

Procedure

Preparatory operations.

- Prior to initiating demolition activities, a competent person must make an engineering survey of the building to determine the condition of the structure and identify areas subject to unplanned collapse. A copy of this inspection must remain on site.
- All utilities must be shut off, capped, or locked out of service beyond the building line before demolition work is initiated.
- Prior to the start of work, a hazard assessment must be performed to identify any hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances that may have been used on the property.
- Where employees are exposed to fall hazards, guardrail and personal fall arrest systems must be used. All hole covers must be identified and secured against accidental displacement.
- Any openings cut in a floor for the disposal of materials can be no larger than 25% of the aggregate of the total floor area, unless the lateral supports of the removed flooring remain in place.
- Contractor/subcontractor shall verify that all local ordinances and permitting issues have been addressed as they relate to demolition.
- Safety data sheets for known demolished material must be provided by the demolition contractor.
- Task lighting—which meets or exceeds the requirements of the standard—shall be provided by the demolition contractor/subcontractor.

Stairs, passageways, and ladders.

- Access to a structure being demolished shall be restricted; tradespersons shall be rerouted to designated stairways, passageways, and ladders. All other points of access shall remain closed.
- All designated access points shall clearly be marked, inspected periodically, and maintained in a clean, safe condition.

Chutes.

- No material may be dropped to a point outside the building unless that area is delineated with a protective barricade and the distance to any point does not exceed 20 feet.
- All chutes must be entirely enclosed except for openings equipped with enclosures at or slightly above the floor level for the insertion of materials.
- At all stories below the top floor chute openings shall remain closed.

- A substantial gate must be installed in each chute at or near the discharge end. A competent person must be assigned to control the operation of the gate and the backing and loading of trucks.
- Chutes must be designed and constructed of such strength as to eliminate failure due to the impact of material and debris loaded into them.
- Fall protection may be required where chute opening may create a fall exposure

Removal of walls, masonry sections and chimneys.

- Masonry walls, including sections of walls, will not be permitted to fall onto the floor of the building under demolition unless an engineer has determined that the floor can withstand the imposed load.
- No wall section, more than one story in height, will be permitted to stand alone without lateral bracing unless it was designed to stand alone.
- Structural or load-supporting members of any floor will not be cut or removed until all stories above such a floor have been demolished or removed.

Removal of walls, floors, and material with equipment.

- Mechanical equipment will not be used on floors unless the floors are of sufficient strength to safely support the equipment.
- Mechanical equipment will only be used for its intended purpose according to the manufacturer's recommendations.
- Curbs or stop logs must be installed and maintained by the demo subcontractor where a possibility exists for equipment going over the edge.

Removal of steel construction.

- Steel construction will be dismantled column length by column length, tier by tier.
- When floors have been removed planking—18" wide by 2" thick—must be used by employees engaged in razing the steel framing.

Mechanical demolition.

- No employees will be permitted in an area where "ball" or "clam" work is being performed. Only employees necessary for the performance of the operation may be permitted in this area.
- The area must be identified with warning barricades and signs.
- During this operation continuous observations, by the competent person, must be made to identifying potential areas of failure.

1.7. Electrical Hazards Prevention

Introduction

Use of electricity on the jobsite poses serious hazards, with employees potentially becoming exposed to such dangers as electric shock, electrocution, fires, and explosions. All Whiting-Turner employees and contractors/subcontractors working on a Whiting-Turner project will comply with NFPA 70E Electrical Safety Practices and 29 CFR 1926, Construction Industry Regulations, Subpart K – Electrical, in addition to the following guidelines.

Procedures

Working on or near exposed energized parts.

- It is Whiting-Turner's policy that no one works on live electrical circuits. If a situation arises where it is impossible to perform a task with the circuit de-energized, the Whiting-Turner Superintendent or Project Manager shall contact the Vice President and submit a formal request detailing why the circuits cannot be deenergized with a live electrical work plan prior to performing the work. An Area EH&S Manager must review the plan. A formal pre-construction meeting shall occur prior to any such work occurring.
- Only qualified electricians may work on electric circuit parts that have not been de-energized under the procedures of 1910.333.
- Such persons must be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials and insulated tools.
- All work must be completed with strict compliance to NFPA 70-E requirements and guidelines.
- The contractor/subcontractor shall provide proof of training for all tradespersons when requested by Whiting-Turner.
- Light switches and receptacles must be protected by permanent or temporary cover plates prior to energizing the circuit.

Ground fault circuit interrupters.

- All 120-volt, single-phase 15 and 20 ampere receptacle outlets which are not part of the permanent wiring of the structure and which are in use by employees shall have approved GFCI's.
- Whiting-Turner requires that all projects are 100% GFCI compliant. An Assured Equipment Grounding Conductor Program may be used in addition to—but not in lieu of—the GFCI program. If permanent power outlets are to be utilized portable GFCI units shall be provided and utilized.
- All GFCI receptacles and circuit breakers shall be tested monthly to ensure the GFCI is properly functioning and protecting the worker. It is the responsibility of the electrical contractor/subcontractor to perform inspection and testing. The documentation shall be made available upon request.

Electric tools.

- All portable electric tools such as saws, hammers, drills, vibrators, and float machines must bear the label of a Certified Testing Agency, such as Underwriters Laboratories, CSA, ETL, or the like.

Extension cords.

- Only round, heavy-duty (type S, SJO, SJTW, ST, SO, STD) are acceptable for use on a construction site; at least 12 gauges or larger.
- Cords must be maintained in their original design configuration.
- Any cord which is damaged or has the grounding pin removed shall be removed from service, including power tools.
- Whenever an extension cord is plugged into permanent power, a GFCI is required between the extension cord and the receptacle.
- All electrical cords shall be out of the hallway, corridor, aisle, stairway, doorways, and exit areas where a tripping hazard may occur.
- All electrical cords shall be protected from damage by equipment, carts, trucks, and other rolling objects.
- Where possible, all extension cords will be suspended (8') above the floor or working surface.
- Extension cords shall not be fastened with staples, hung from nails, suspended with non-insulated wire, or hang from fire sprinklers.
- Extension cords shall not be run thru or laid over sharp metal objects that could subject the cord to cuts and possible unintentional energization.

Temporary wiring.

- All temporary wiring and lighting must meet current NEC codes.
- Temporary lighting must never be put on the same circuit as temporary receptacles.
- All temporary lighting circuits must originate from GFCI protected breakers.
- Temporary wiring must be rated for all conditions to which it may be subjected and installed per the requirements of NEC, OSHA, NFPA, and other authorities having jurisdiction.

Temporary lighting.

- The minimum illumination level 5 foot-candles; this shall be maintained by the electrical contractor at all times.
- Installation of temporary lighting must be per manufacturer's specifications and in compliance with OSHA, NFPA, NEC and local codes.

Fish tapes.

- Fish tapes or lines made of metal or any other conductive material are prohibited when the potential for contact with energized circuits exist; non-conductive tapes and lines will be used instead.

1.8. Energy Control Policy

Introduction

The intent and purpose of this procedure is to reduce or eliminate the danger of the unexpected release of stored or residual energy that could cause injury or death to the employee or to the public. Each contractor/subcontractor working on a Whiting-Turner project will comply with 29 CFR §1926.417, "Locking and Tagging of Circuits", in addition to 29 CFR §1910.147, "The Control of Hazardous Energy" along with the following guidelines.

Procedures

- Lockout/tagout (LOTO) shall not be considered for use until all other avenues of attaining a "zero-energy state" (all potential sources of any type including re-energization or stored) have been exhausted.

- All contractors/subcontractors working with electrical systems are required to have a written lockout/tagout procedure. A competent person shall be responsible to control all aspects of the LOTO procedure. They will ensure coordination with the appropriate tradesmen.

- If a system can be locked out through design or by other means, this will be the preferred method.

- The lockout device shall be substantial enough to prevent removal.

- The lock shall be a separately keyed lock for use only with the lockout system.

- The lockout device must be tagged with the name of the employee and their company. There shall be one lock for each employee (including Whiting-Turner) exposed to the system.

- If working in a multi-shift environment each worker shall remove their respective locks at the end of their shift. If work on the system is to continue, the next shift worker shall be present to install his lock immediately following removal of the lock from the previous shift. The creating contractor shall have a system in place to ensure that exposure is eliminated by controlling the potential hazardous energy by means of LOTO.

- Workers shall not leave locks on after the completion of their task. This does not apply to the competent person or supervisor. The use of 100% LOTO must be maintained by the responsible contractor/subcontractor until the completion of the task. Verification by all competent persons in charge of the LOTO shall be completed prior to re-energizing the system.

- If the energy isolation device cannot be locked out and a tag must be used, authorization from the Area EH&S Manager and Vice President is required prior to start of work.

- Tag out devices, including the means of attachment, shall be substantial enough to prevent accidental removal.

- The tag shall warn against energizing the tagged-out system such as: do not start, do not open, do not close, do not energize, do not operate, etc.

- The name of each employee shall be displayed on respective tags.

- The competent person shall be responsible for removing the tag and activating the system after all exposed employees have removed their tags.

- In the event an employee is discovered tampering with or violating the LOTO procedure, the employee will be removed from the project indefinitely.

Training and Documentation

- Each employer utilizing LOTO must establish a program and utilize procedures for affixing appropriate lockout or tagout devices to energy isolating devices, and to otherwise disable machines, piping, or equipment to prevent unexpected release of stored or residual energy to prevent injury to employees.

- Each employee affected by the LOTO procedure shall be trained in the procedure. Records of training will be kept on site and be made available to Whiting-Turner upon request.

- Each contractor/subcontractor involved in LOTO procedures shall maintain a log on site that identifies the following:
    - Date of usage
    - Number of locks and tags used
    - Persons involved
    - Time of LOTO initiation
    - Time of LOTO removal
    - Designated competent persons
    - Location of LOTO Devices

- Electrical or piping and instrumentation drawings identifying specific locations of the LOTO devices shall accompany the log.

- Locks shall only be removed by the person who applied the lock. In extreme circumstances, after "all reasonable means" to contact the employee who was responsible for the lock were exhausted, the Whiting-Turner Superintendent shall request a meeting with the Area EH&S Manager and contractor's/subcontractor's competent person. This process is to ensure that the contractor's/subcontractor's competent person has considered and documented all the necessary steps to keep the workforce safe prior to removing the lock. The decision to remove a lock rests solely with the contractor's/subcontractor's

competent person. However, the decision to remove a lock may be overridden by the Area EH&S Manager, if deemed necessary.

1.9. Excavations Policy

Introduction

The intent of this policy is to limit and/or eliminate the dangers associated with excavation and trenching operations that could expose tradespersons to the possibility of severe injury or death. Each contractor/subcontractor working on a Whiting-Turner project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart P – Excavations, in addition to the following guidelines.

Procedures

Prior to the commencement of excavation activities where the excavation will be greater than three (3) feet in depth, a pre-excavation checklist must be completed by the contractor's/subcontractor's competent person and submitted to the Whiting-Turner project team.

Specific excavation requirements.

- Subcontractors whose employees will be entering trenches or excavations must ensure that a comprehensive training program in the recognition, identification, evaluation, and control of excavation hazards must be provided to all tradespersons prior to working in an excavation or trenching operation. This must also include a review of the geo-technical report.
- Underground utility installations must be identified and marked prior to beginning any excavation. To prevent unintentional contact, all necessary measures must be employed to locate underground utilities prior to excavating. Acceptable methods include but are not limited to the following: test pitting, ground penetrating radar (GPR), use of as-built drawings and any other obtainable information.
- When an excavation is performed within 3 feet of any utility line, a non-damaging method of excavation shall be used. The non-damaging method shall be hand digging with nonconductive tools. Other non-damaging methods, such as soft digging, vacuum digging, pneumatic hand tools, may be considered subject to approval by the competent person.
- A competent person must be identified on Whiting-Turner's competent person acknowledgment form and their qualifications submitted to the Whiting-Turner project team prior to the start of work.
- The competent person will be on-site during all excavation work to determine the soil type and its stability by performing one visual and one manual test in accordance with 29 CFR 1926, Subpart P Appendix A.
- Inspections must be conducted daily and after every rainstorm or other hazard-increasing occurrence. Daily inspection reports must be submitted to the Whiting-Turner project team upon request.
- All trenches, unless otherwise specified, shall be protected by snow fence, at a minimum.

Requirements for protective systems.

- Excavations greater than 5 feet in depth must be protected by one or more of the following systems as determined by the subcontractor's competent person:
    - Sloping / benching of sides to allowable configurations and slopes as per soil type.
    - Shielding (i.e. trench boxes) or shoring which shall have the manufacturer's tabulated data and specifications—or a professional engineer stamp—and current annual inspection documentation; all the aforementioned must be on site.
    - Using a slope or shield system designed by a registered professional engineer. Refer to 29 CFR Subpart P, Appendix B.
- Temporary and permanent spoils shall not exceed the angle of repose and shall be kept back at least two feet from the edge of an excavation.
- A registered professional engineer must design sloping or benching systems for excavations greater than 20 feet in depth.

Requirements for fall protection.

- Persons walking or working adjacent to a trench with vertical/shear walls that is equal to or greater than six (6) feet in depth must be protected from fall hazards unless it has been determined by the contractor's/subcontractor's competent person that it is infeasible or creates a greater hazard.
- Person crossing an excavation that is equal to or greater than six (6) feet in depth must be protected from fall hazards by means of a guardrail system.

Training Requirements

- Subcontractors whose employees will be entering a trench or excavation must have received training on recognizing and avoiding hazardous atmospheres, caught-in/between hazards due to cave-in/collapse, entrapment due to access & egress hazards, struck-by falling objects and equipment and falls into excavations.
- Atmospheric monitoring, if deemed necessary by the competent person or other competent party, must be documented, and conducted by someone trained in the use of atmospheric monitoring equipment.

1.10. Fall Protection and Prevention Policy

Introduction

Falls continue to be the leading cause of fatalities in the construction industry; in consequence, Whiting-Turner has zero tolerance for failure to comply with all provisions of our fall protection and prevention policy. Any tradespersons found violating said policy must be retrained. In addition, at the discretion of Whiting-Turner personnel, violators may be permanently removed from the project. Any contractor/subcontractor with any fall exposure must submit to Whiting-Turner the resume of their competent person trained in fall protection techniques. All Whiting-Turner employees and all contractor/subcontractor employees working on a Whiting-Turner project shall comply with 29 CFR 1926, Construction Industry Regulations, Subpart M - Fall Protection, in addition to the following guidelines.

Procedures

General fall protection requirements.

- Each contractor/subcontractor, with employees exposed to a fall 6' or greater to a lower level must ensure that effective fall protection measures and rescue procedures are addressed in their company activity hazard analysis (AHA) prior to beginning work on site. This is to include the name and qualifications of the designated competent person.
    - Exception: The provisions of this part do not apply when inspectors and competent persons are briefly inspecting, investigating, or assessing workplace conditions.
    - Exception: Fall protection policy includes any surface, except ladders, vehicles, or trailers.
    - Under the terms of 1926.500, fall protection is not required for employees who are on vehicles and trailers when the employee must be on the vehicle or trailer to perform his or her duties. For example, if the employee must climb on the tractor trailer rigs to connect the rigging for loading and unloading materials and equipment, the employer will utilize the sound judgement of their competent person for Fall Protection activities to determine how to best proceed.

- If at any time during work at heights, it is observed that the means as stated in the subcontractor's AHA for protecting the workers from falls are perceived as ineffective, work will be suspended until the subcontractor's competent person assesses the situation and makes necessary corrections. If corrections determined by the competent person involve modified work practices listed in the subcontractor's AHA, then these changes must be completed, and any necessary retraining must be provided to affected workers prior to allowing the continuation of the subcontractor's work at heights.
- At no time shall a safety monitor system be used as a sole means of fall protection.
- The use of controlled access zones (CAZ) and controlled decking zones (CDZ) as a means of fall protection are prohibited on Whiting-Turner projects.
- A Personal Fall Arrest System (PFAS) [comprised of a full body harness, double lanyards, anchorage point and anchorage connector], a personal fall restraint system

(PFRS) [comprised of a full body harness, lanyard, anchorage point and anchorage connector], a guardrail, or safety net system must be in place to protect all trade persons from exposure to falls working at or above 6 feet.

- Employees must be protected from falling objects by the installation of toe boards, barricades, or canopy structures.
- Employees working on ladders must be at least one and a half times the height of the ladder away from any perimeter, shaft, stairway, and opening where the fall distance exceeds 6'. If that distance is not feasible, a conventional fall protection method must be employed.
- Stilts are only permitted in broom swept areas, where there is no change in elevation.
- Non-roofing activities – contractors/subcontractors other than roofers who must perform work on roofs must develop a written/drawn plan showing the roof area where work is planned to take place to protect their workers from potential exposure to falls. The plan must be provided to the Whiting-Turner team for review by Whiting-Turner's Superintendent and EH&S Manager.

Floor and wall holes and openings.

- Prior to creating a hole or opening in any elevated work surfaces, contractors/subcontractors must submit an elevated work surface modification permit.
- All floor and roof openings into which persons can accidentally walk or fall through shall be guarded by a physical barrier or covered.
- All floor and roof holes through which equipment, materials, or debris can fall shall be covered.
- All floor holes greater than 12" x 12" must have a Whiting-Turner floor hole cover sign in place. Smaller holes shall be labeled "hole" in accordance with the OSHA standard.
- Coverings for floor and roof openings shall be of sufficient strength to support two times the maximum intended load that may be imposed and shall be secured in place to prevent accidental removal or displacement.
- Conduits, trenches, and manhole covers and their supports, when exposed to vehicles or equipment, shall be designed to carry a truck rear axle load of two times the maximum anticipated load.
- Particle board, medium density fiber board (MDF) or similar material is prohibited from being used as floor hole covers on Whiting-Turner projects.
- Wall openings 18" or greater in width from which there is a drop of 6' feet or greater and the bottom of the opening is less than 39" above the working surface, shall be guarded with a top rail or a top rail and intermediate rail or a standard guardrail. A toe board or enclosing screen shall be provided where the bottom of the wall opening, regardless of width, is less than 3 ½ inches above the working surface.
- Wall opening protection shall meet one of the following requirements:
    - Barriers of such construction and mounting that, when in place at the opening, the barrier can withstand a load of at least 200 pounds applied in any direction (except upward) with a minimum of deflection at any point on the top rail or corresponding member.

- A hinged floor-opening cover shall guard every hatchway and chute floor opening. Or the opening shall be barricaded with railings to leave only one exposed side. The exposed side shall be provided either with a swinging gate or so offset that a person cannot walk into the opening.
- An extension platform outside a wall opening onto which materials can be hoisted for handling shall have a standard railing that meets handrail standards. However, the inside of an extension platform may have removable railings to facilitate handling materials. Workers removing guardrails must utilize personal fall prevention equipment to tie off while working on or near platforms that are not 100% protected by guardrail.

Fall protection systems.

- Guardrail Systems
  - The top rail height of a guardrail system must be 42", + or – 3". Midrail heights must be half of that distance.
  - Perimeter cable shall not be less than 3/8" steel cable.
  - Corner uprights must be braced so that the required tension may be maintained.
  - The cable must be terminated with three U-bolt wire rope clips that maintain an efficiency rating of at least 80% of the wire rope's breaking strength as proven through product documentation (e.g. Crosby clips).
  - The U-bolt clips must have the U-bolt section on the dead or short end of the rope and the saddle on the live or running end of the rope.
  - The use of any combination of hook turnbuckles as part of the perimeter cable system is prohibited.
  - A Personal Fall Arrest System (PFAS) must not be attached to a guardrail system unless a registered professional engineer designs the system to accommodate the PFAS; documentation of that design must be maintained on site.
  - The top rail of guardrail systems must be able to withstand a force of 200 lbs. in all directions, without failure, and must be smooth surfaced to prevent hand injuries.
  - The contractor/subcontractor installing the perimeter cable guardrail system shall submit a design with details on how the system will be installed and maintained.
  - All guardrail systems [with the exception of scaffolds systems or where it can be proven to create a greater hazard] must be equipped with orange perimeter screening or mesh to prevent the ability to breach the system by climbing through rails. The installation of the screening must be compliant with Whiting-Turner's orange perimeter screening guidelines. The orange perimeter screening policy satisfies the requirement of flagging a wire rope guardrail system every 6' for high visibility.

- Personal Fall Arrest Systems and Fall Restraint Systems

- A PFAS must be used when working from suspended scaffolds, when breaching any guardrail systems, and when working near unprotected floor openings and perimeter edges.
- A fall restraint system must be employed when working from articulating boom man lifts.
- A competent person must assure that fall distance calculations have been evaluated in each circumstance where a PFAS is used.
- A PFAS is not required when climbing up or down a ladder. Fall protection shall be considered by the competent person if employees work from a ladder 6' or more above a lower level and are exposed to a fall.
- Employees must use positive fall protection devices when working in proximity to any leading edge.
- Retractable lanyards must incorporate either a 3/16" steel wire cable or a nylon strap with a minimum width of 1".
- All anchorage points utilized in a personal fall arrest system must be capable of supporting a load of no less than 5000 lbs.
- Steel erectors and metal decking installers shall utilize 100% fall protection devices at all times when working at 6' or above.
- Horizontal lifelines must be designed by a registered engineer and installed under the supervision of a qualified person. A safety factor of two must be maintained.
- Adequate fall protection devices must be provided, installed, and used at all loading platforms by the contractor/subcontractor wishing to remove existing perimeter protection prior to its removal.
- Rescue procedures must be provided in writing when using a personal fall arrest system.

Training Requirements

- Each employee exposed to a fall hazard must be trained by a competent person in the recognition and avoidance of such a hazard. Proof of training shall be made available to Whiting-Turner upon request.

- Specific training includes, but is not limited to the following:
  - The type of fall exposures expected
  - The correct procedures for erecting, maintaining, dismantling, and inspecting of any fall protection system used by the employee

- When employee lacks the understanding and demonstrative skill required for the proper application of fall protection systems, the employer shall provide retraining of such employee(s).

- Retraining documentation—to include instructor's name and qualifications, training literature and sign-in sheet—must be submitted to the Whiting-Turner project team on subcontractor's letterhead.

1.11. Fire Protection and Prevention

Introduction

Each contractor/subcontractor working on a Whiting-Turner project must comply with 29 CFR 1926, Construction Industry Regulations, Subpart F – Fire Protection and Prevention, in addition to the following guidelines.

Procedures

General requirements.

- Contractor/subcontractors involved in any spark producing activity must plan to provide adequate fire extinguishers no less than 10' from their work.
- Contractor/subcontractor fire watch personnel must be trained in the use and limitations of fire extinguishers.
- Client requirements permit procedures, fire watches, shields and blankets must be considered when developing site-specific fire prevention procedures.
- All firefighting equipment must be clearly visible and access to the equipment must be maintained at all times.
- Travel distance to a fire extinguisher shall not exceed 100 feet.
- Each portable fire extinguisher shall undergo an annual certification & have an inspection tag affixed. These services shall be performed by qualified, authorized, certified and actively licensed fire extinguisher companies.
- Portable fire extinguishers must be inspected monthly. The documentation must be a weather resistant tag attached to the extinguisher. A fire extinguisher log is recommended for back-up.

Fire prevention.

- Temporary offices or trailers, when located inside of a building under construction, must be constructed of fire retardant materials.
- Combustible materials, such as cardboard, wooden pallets, etc., must be removed from the work area immediately.

Flammable liquids.

- All storage, handling or use of flammable liquids shall be under the supervision of qualified persons.
- All sources of ignition shall be prohibited in areas where flammable liquids are stored, handled, and processed. Suitable NO SMOKING OR OPEN FLAMES signs shall be posted in all such areas.
- Contractor/subcontractor must provide and mount a 20lb ABC fire extinguisher between 25'-75' from flammable storage.
- Flammable liquids shall not be stored in areas used for exits, stairways or used for safe passage of people.
- Dispensing systems shall be electrically bonded and grounded.

- Above ground storage tanks shall be double-walled or provided with a secondary means of containment. Secondary containment shall have a capacity at least equal in volume to that of the largest tank plus 10 percent of all other tanks enclosed. Provision shall be made for draining off accumulations of ground or rainwater or spills. Drain plugs shall remain in place except when draining.
- A metal cabinet meeting the requirements of NFPA 30, Flammable and Combustible Liquids, shall be provided for the storage of more than a total of 25 gallons of flammable liquids and greases in buildings used for other than storage or processing. Not more than a total of 60 gallons shall be stored in any one cabinet. Individual containers must be metal, kept tightly closed, and shall not exceed five (5) gallons capacity.
- Smoking or open flames within 50 feet of where flammables are being used or transferred or where equipment is being fueled is prohibited.
- Areas in which flammable liquids are transferred, in quantities greater than 5 gallons from one tank or container to another tank or container, shall be separated from other operations by 20 feet or by a five-foot partition, having a fire resistance of at least one hour. Drainage or other means shall be provided to control spills, Natural or mechanical ventilation shall be provided to maintain the concentration of flammable vapor at or below 10 percent of the lower flammable limit.
- Workers shall be required to guard carefully against any part of their clothing becoming contaminated with flammable liquids. They shall not be allowed to continue work when their clothing becomes contaminated and must remove or wet down the clothing as soon as possible.
- Equipment using flammable liquid fuel shall be shut down during refueling, servicing or maintenance.
- Where an automatic extinguishing system is provided, the system shall be designed and installed in accordance with NFPA recommendations.
- In every inside storage room there shall be one clear aisle maintained at least three feet wide.
- Outdoor portable tanks shall be at least 20 feet from buildings. Individual tanks shall be at least 5 feet apart.
- The dispensing units shall be protected against collision damage.
- Handling of all flammable liquids by hand shall be in safety containers with flame arresters. This requirement shall not apply to those flammable liquid materials that are extremely hard to pour, that may be handled in original shipping containers. For quantities of one gallon or less, only the original container or approved metal safety cans shall be used for storage, use and handling of flammable liquids.
- Storage of flammable/combustible liquids on or inside of buildings under construction shall be no more than one-day supply.

Paints and painting.

- Paints, varnishes, lacquers, thinners, or other volatile painting materials and containers shall be kept tightly closed when not in use and shall be stored in accordance with NFPA recommendations.

- Unopened containers of paint, varnishes, lacquers, thinners, and other flammable paint materials shall be kept in a well-ventilated location, free of excessive heat, smoke, sparks, flame, or direct rays of the sun.
- Paint-soiled clothing and drop cloths, when not in use, shall not be stored on site.
- Paint scraping, and paint-saturated debris shall be removed daily from the premises.
- Ventilation adequate to prevent the accumulation of flammable vapors to hazardous levels shall be provided in all areas where painting is done, or paints are mixed.

Liquid petroleum gases.

- Storage, handling, installation and use of liquefied petroleum gases and systems shall be in accordance with NFPA 58. LP gas shall not be stored indoors.
- Liquefied petroleum gas containers and equipment shall not be used in unventilated spaces below grade in pits, below decks and other such spaces where dangerous accumulations of heavier-than-air gas may accumulate due to leaks or equipment failure.
- Equipment using liquefied petroleum gas shall be shut down during refueling operations.
- Filling of fuel containers for motor vehicles from bulk storage containers shall be performed not less than 10 feet from the nearest masonry-walled building, or not less than 25 feet from the nearest building or other construction and, in any event, not less than 25 feet from any building opening.
- Filling of portable containers or containers mounted on skids from storage containers shall be performed no less than 50 feet from the nearest building.

Gasoline power.

- Fire
    - Only approved containers are allowed for the storage of flammable liquids. An approved container is one which is constructed of metal, has a spring-loaded top that allows venting of fumes and contains a flash arresting screen and spout cover.
    - Provide a 20-pound ABC dry chemical type extinguisher between 25'-75' from area where flammable liquids are being handled
    - "No Smoking" and "No Open Flame" signs must be conspicuously posted in service, refueling, or flammable liquid storage areas.
    - All drums shall be properly labeled in accordance with 29 CFR 1910.1200 Hazard Communication.
- Fumes
    - Gas engines exhaust carbon dioxide and carbon monoxide. Dioxide is heavier than air; monoxide slightly lighter. A mixture of the gases usually is heavier than air although heat may cause it to rise. Both are without color, taste or smell. Light concentrations cause headache and nausea. Death is swift in heavy concentrations. A few minutes may be too long. Do not discount this hazard. If anyone exhibits symptoms, do not attempt rescue without proper personal protection equipment.
    - Do not run gas engines in pits, manholes or confined spaces.

- If gas engines are to be used inside buildings, excavations, crawl spaces under basement floors, hoist engineers' shanties, then the following must be done:
  1. Ventilation shall be required
  2. Testing the space for carbon monoxide shall be done before starting the engines
  3. Continuous monitoring

Temporary heating devices.

- Fresh air must be supplied in quantities sufficient to maintain the health and safety of all employees. If a competent person deems natural airflow inadequate, then mechanical ventilation must be provided.
- Heaters used in the vicinity of tarpaulins, canvas or similar coverings must be located at least 10' from the covering and be secured to prevent ignition due to wind.
- Open fires are not allowed on Whiting-Turner projects.
- All gas piping shall be labeled and flagged or painted; shutoff valves shall remain in place.
- Whiting-Turner permits the use of direct fired and indirect fired heaters for temporary power. Clearance from combustibles shall be maintained per the manufacturer's requirements. Direct fired temporary heaters must be equipped with the following:
  - High temperature limit switch—monitors operating temperature of equipment; provides automatic shutdown.
  - Air proving control—continuously monitors operating airflow, provides automatic shutdown.
  - Low voltage reset—provides protection for insufficient incoming power.
  - Redundant solenoids—dual gas valves as required, for redundant gas flow protection.
  - Electronic ignition sequence—flam safety start-up with continuous electronic monitoring of equipment in firing mode of operation.

Note: Housekeeping is the best defense against fires. All trash and debris shall be placed in proper containers.

1.12. Hand and Power Tools Policy

Introduction

All Whiting-Turner Employees and Contractors/subcontractors working on a Whiting-Turner project must comply with 29 CFR 1926, Construction Industry Regulations, Subpart I – Tools – Hand and Power, the manufacturer's safety recommendations, and the following guidelines.

Procedures

General requirements.

- Hand and power tools must be maintained in a safe condition, per manufacturer's guidelines.
- If the tool is designed to accommodate a guard, the guard must be in place while the tool is being used.
- Tools manufactured with a handle shall be used with the handle in place.
- All two-handed tools must be used with two hands.
- Additional personal protective equipment (PPE), such as a face shield or hearing protection, may be required while operating a tool. If so, they must be in use.
- Any person found making a tool guard inoperable will be immediately removed from the site.

Hand tools.

- Drift pins, wedges, chisels, and other impact tools must be kept free of mushroomed heads.
- Wrenches must not be issued or used when the jaws are sprung, and slippage is probable.

Electric powered tools.

- All power tools must be double insulated or provided with a three wire, grounded connection.

Pneumatic power tools.

- Each connection on a pneumatic tool and air hose must be secured with a "whip-check" or similar device.
- All air hoses, with an inside diameter exceeding ½ inch, must have a flow reduction device (OSHA valve) at the supply source to reduce pressure in case of hose failure.
- Compressed air must not be used for cleaning unless the pressure is reduced to less than 30 psi and appropriate guarding and PPE are in place.

Fuel powered tools.

- Fuel powered tools must be stopped and turned off while being refueled, serviced, or maintained.

Powder-actuated tools.

- Users of powder actuated tools must be properly trained and certified to operate the equipment. Certification must always be kept on the user's person while the tool is in use.
- The manufacturer, or a representative thereof, must train workers in the safe use of powder-actuated tools.
- The tool must be tested each day, according to manufacturer's recommendations, before loading to see that safety devices are in proper working condition.
- Tools must not be loaded until just prior to the intended firing time.
- Loaded tools must not be left unattended.
- All tools must be used with the correct shield, guard or attachment recommended by the manufacturer.
- Unspent shots must be disposed of according to the manufacturer's recommendation and must be removed from the site by the user each day.

Abrasive wheels and tools.

- The RPM rating on all grinding machine motors must not exceed the speed rating of the grinding wheel attachment.
- The grinding wheel shall be compatible with the grinder for which it is being used (i.e. proper size and type).
- All abrasive wheels must be closely inspected, and ring tested before mounting to ensure they are free from cracks or defects.

Woodworking tools.

- All portable, power driven circular saws must be equipped with guards above and below the base plate or shoe.
- When the tool is withdrawn from the wood, the lower guard must automatically and instantly return to the covering position.
- Any worker found disabling a blade guard will be immediately removed from the site.
- Saws must have the electrical cord unplugged when making blade adjustments or changing blades.

1.13. Hearing Conservation

Introduction

Whiting-Turner recognizes that excessive noise can cause permanent hearing loss if appropriate administrative or engineering controls or personal protective equipment is not used. Limiting exposure to excessive noise through engineering controls is Whiting-Turner's preferred method of control.

Procedures

Permissible Noise Exposures

Duration per day, hours	Sound level dba, slow response
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

- Protection against the effects of noise exposure must be provided when the sound levels exceed those shown in the table above. The measurement must be observed on the A-scale of a sound level meter at slow response.

- When employees are subjected to sound levels exceeding those shown above, feasible administrative or engineering controls must be utilized.

- If such controls fail to reduce sound levels within the levels shown above, personal protective equipment must be provided and used to reduce the noise exposure.

- In all cases where the sound levels exceed the values shown in the table above, a continuing, effective hearing conservation program must be administered.

- If the noise levels are determined to cause an 8-hour TWA exposure greater than 85 dba, the contractor/subcontractor must provide a comprehensive hearing conservation program before continuing work. At a minimum this program shall include:
    - Noise survey data for typical work they perform.
    - Noise dosimetry data for typical exposures from the work they perform.
    - Training records for employees working on the Whiting-Turner Project.

1.14. Hexavalent Chromium

Introduction

Hexavalent chromium (Cr(VI)) compounds are widely used in the chemical industry as ingredients and catalysts in pigments, metal plating and chemical synthesis. Hexavalent chromium can also be found in the construction industry through welding on stainless steel or on hexavalent chromium painted surfaces. The major health effects include lung cancer, nasal septum, skin ulcerations, and contact dermatitis. The purpose of this policy is to prevent employee exposure to hexavalent chromium compounds during construction activity. Each contractor working on a Whiting-Turner project must comply with 29 CFR §1926.1126, Chromium (VI), in addition to the following guidelines.

Procedures

Permissible exposure limit.

- Since this construction activity is limited to specialty work, Whiting-Turner will direct the Contractor/subcontractor to provide specific Activity Hazard Analysis (AHA) meetings to address potential exposure.
- The Employer must ensure that no employee is exposed to an airborne concentration Cr(VI) in excess of 5 micrograms per cubic meter of air (5 ug/m^3) calculated as an 8-hour time-weighted average (TWA).
- Engineering controls are the preferred method to achieve the Permissible Exposure Limit (PEL).

Exposure determination.

- The contractor/subcontractor must determine the 8-hour TWA exposure for each employee exposed to Cr(VI). This may be accomplished using two options; scheduled or performance-oriented monitoring.
- Scheduled Monitoring
    - The contractor/subcontractor must perform initial monitoring to determine the 8-hour TWA for each employee based on a sufficient number of personal breathing zone samples.
    - If the contractor/subcontractor does representative sampling, it must be conducted on the employee(s) expected to receive the highest exposure.
    - If the monitoring indicates that employee exposures are below the action level (1/2 the PEL or 2.5 ug/m3), the employee may discontinue monitoring.
    - If the monitoring indicates that employee exposures are at or above the action level, the contractor/subcontractor must perform periodic monitoring at least every six months.
- Performance-Oriented Monitoring
    - If this option is chosen, the contractor/subcontractor must determine the 8-hour TWA for each employee based on any combination of air monitoring, historical data, or objective data sufficient to accurately characterize employee exposure to Cr(VI).

Methods of compliance.

- As stated previously, engineering and work practice controls must be used to reduce and maintain employee exposure to Cr(VI) to or below the PEL.
- If feasible engineering and work practice controls are insufficient to reduce exposure below the PEL, then respiratory protection must be used.
- The contractor/subcontractor will not be allowed to rotate employees to different jobs to achieve compliance with the PEL.

Respiratory protection.

- Respiratory protection use must comply with OSHA's Respiratory Protection requirements.
- The contractor/subcontractor must provide respiratory protection in the following circumstances:
    - Periods necessary to install or implement feasible engineering or work practice controls.
    - Work operations where an employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce the PEL.
    - Emergencies

Protective work clothing and equipment.

- Where there may be a hazard to the skin or eyes from exposure to Cr(VI) the contractor/subcontractor must provide protective clothing or equipment to the employee.
- The contractor/subcontractor must ensure that the employees remove all clothing and equipment that may be contaminated with Cr(VI) when the work is complete or at the end of the shift.
- The contractor/subcontractor must ensure that chromium-contaminated clothing is not removed from the workplace.
- When contaminated protective clothing or equipment is removed for laundering or cleaning, the contractor/subcontractor must ensure that it is stored and transported in impermeable bags or containers.
- The contractor/subcontractor must inform any person who launders or cleans clothing or equipment of the potential effects of exposure to Cr(VI) and that the clothing or equipment should be laundered or cleaned in a manner that minimizes skin or eye contact.

Hygiene areas and practices.

- Where protective clothing and equipment is required, the contractor/subcontractor must provide change rooms that comply with 29 CFR 1926.51.
- Where skin contact may occur, the contractor/subcontractor must provide hand-washing facilities that comply with the previously noted standard.

Medical surveillance.

- The contractor/subcontractor must make medical surveillance available, at no cost, to employees who meet the following criteria:
    - o Those who are or may be occupationally exposed to Cr(VI) at or above the action level for 30 or more days a year
    - o Those who are experiencing signs or symptoms of adverse health effects associated with Cr(VI) exposure
    - o Those exposed in an emergency

Communication.

- Must follow the same communication of hazardous chemicals highlighted in Whiting-Turner's Hazard Communication Program.

Recordkeeping.

- The contractor/subcontractor must maintain the following data records:
    - o Air monitoring
    - o Historical monitoring
    - o Objective data
    - o Medical surveillance

1.15. Housekeeping

Introduction

These requirements apply to all work performed by Whiting-Turner employees, contractors/subcontractors, and vendors. Each contractor/subcontractor working on a Whiting-Turner project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart C – General Safety and Health Provisions

Procedures

- Work areas and paths of ingress/egress must be kept clear and free of obstructions by material/debris.
    - Clean-as-you-go practices are required.
    - Require contractors/subcontractors to sort and organize material, sweep daily, and standardize activities to aid in the elimination of storage of excess/unused material in active work areas
    - Materials shall not be stored in a manner that will block, restrict, impede, or prevent access to an egress path or emergency equipment, such as fire extinguishers, emergency eyewash or shower, emergency shutoff buttons or emergency disconnect devices.
    - Work that may temporarily block emergency exits, safety showers, elevators, corridors, and hallways will require prior Whiting-Turner approval.

- Power Cord Management:
    - All cords must be inspected before use.
    - At no time shall cords be strung across exits or in front of emergency equipment.
    - Run cords overhead in a supported fashion with nonconductive material, when feasible.
    - Run cords around perimeters, when feasible.
    - Tape cords down or use cord covers if they present a tripping hazard.
    - Support all cords that run through floors or ceilings with appropriate means.
    - All cords must be stored and put away after use. (i.e. not coiled up on floor).
    - All extension cords must be equipped with GFCI protection or be plugged into an outlet equipped with GFCI protection.
    - If the above listed safety requirements cannot be met, temporary wiring must be installed to facilitate proper cord management.

- Material Storage:
    - Materials stored near the area where work is performed should be limited to only those materials that will be used in the same shift.
    - Any material stored in a work area longer than 24 hours must be approved by Whiting-Turner.
    - Store all items neatly in cabinets or on shelves.
    - Gang boxes, toolboxes, and sea containers/conex boxes shall not have materials stored on top of them.

- If more storage area is needed, contact Whiting-Turner Superintendent.

- Chemical Storage:
  - All chemicals brought on site must have been specified for use on the project.
  - The user of the chemical must provide Whiting-Turner an SDS prior to bringing the substance on site.
  - All chemicals and equipment containing chemicals must be stored in approved areas (i.e. chemical cabinet).
  - Contractors are responsible for removing all unused chemicals from the Whiting-Turner project site at the completion of their contract.
  - All chemical containers must be properly labeled.
  - Chemical/gas cylinders (welding, purging, leak detection cylinders, etc.) must be secured at all times.
  - All dedicated chemical storage areas must have safety data sheets (SDS) available at the storage location.

- Material/Waste Disposal:
  - Waste disposal methods shall be specified within each contract/subcontractor's Activity Hazard Analysis (AHA) and Work task Plan (PTP).
  - All hazardous waste must be disposed of in accordance with Federal, State, and Local regulations and shall comply with applicable Whiting-Turner hazardous waste programs.
  - All hazardous waste must be properly labeled.
  - Hazardous waste materials must be discarded into proper disposal containers
  - Non-hazardous waste must be disposed of into appropriate recycle or disposal containers.

1.16. Materials Handling and Rigging Policy

Introduction

Material handling and rigging incidents account for many tradespersons compensation claims annually. Each contractor working on a Whiting-Turner project must comply with 29 CFR 1926, Construction Industry Regulations, Subpart H – Materials Handling, Storage, Use and Disposal, in addition to the following guidelines.

Procedures

General material storage.

- Aisles and passageways shall be kept clear at all times for the safe movement of material handling equipment and employees.
- Materials shall not be stored within 6' of any hoist way or interior floor opening.
- Materials shall not be stored within 10' of an exterior wall which does not extend above the material.

Rigging.

- General Requirements
  - Before each use rigging equipment, including its fastenings and attachments, must be inspected by a competent person/qualified rigger.
  - Inspections must also be conducted during use and where additional service conditions warrant.
  - Defective or damaged slings must be removed from service immediately and destroyed or tagged out of service.
  - Taglines shall be utilized to minimize worker exposure to falling and swinging loads.

- Lifting Chains
  - Alloy steel lifting chains must have a permanently affixed, durable identification tag stating size, grade, rated capacity, and sling manufacturer.
  - Attachments, including, but not limited to hooks, rings, oblong links, pear-shaped links or other welded or mechanical links, must have a rated capacity at least equal to the lifting chain.
  - Job made shop hooks or links, makeshift fasteners formed from rebar or bolts or other such attachments are not allowed on Whiting-Turner projects.
  - Additional lifting chain inspection criteria is based upon the frequency of use, the severity of the service conditions, the nature of the lifts being made, and the experience gained on the service life of slings used in similar circumstances.
  - Lifting chains shall be inspected, prior to each use.

- Wire Rope Slings
  - The manufacturer's safe working loads must be followed at all times.

- Wire rope must not be used if, in any length of eight diameters, the total number of visible broken wires exceeds 10% of the total number of wires.
- Wire rope must not be used if it shows signs of excessive wear, corrosion, or defects.
- Slings shall not be shortened with knots, bolts, or other makeshift devices.
- Slings must be protected from sharp edges with padding, softeners, or similar devices.
- Shock loading of a sling is prohibited, and slings must not be pulled from under a load when the load is resting on the sling.

- Synthetic Slings
  - Each synthetic sling must be identified with the name of the manufacturer, rated capacities, and type of material.
  - Synthetic slings must be immediately removed from service if any of the following conditions are present; acid or caustic burns, melting or charring of any of the sling surface, snag, puncture, tear or cut, broken, or worn stitches or distorted fittings.
  - Slings must be protected from sharp edges with padding, softeners, or similar devices.

1.17. Medical Services Staffing Policy

Introduction

Each contractor/subcontractor must have one person on site with a valid certificate in first aid and cardio pulmonary resuscitation (CPR) while actively engaged in work activities. The Whiting-Turner Contracting Company will have, at all times, an individual on site with a valid certificate in first aid and cardio pulmonary resuscitation (CPR).

Procedures

- In addition to the first aid kit Whiting-Turner supplies, each contractor's/subcontractor's first aid kit must be in compliance with Whiting-Turner's Bloodborne Pathogen Policy.
- The contents of the first aid kit shall be placed in a weatherproof container with individual sealed packages for each type of item and must be inspected at least weekly.
- Emergency telephone numbers shall be conspicuously posted.
- Where the eyes or body of any person may be exposed to injurious corrosive materials (e.g. during concrete placement), suitable facilities for quick drenching or flushing of the eyes and body must be provided within the work area for immediate emergency use.

1.18. Mobile Elevated Work Platforms

Introduction

Each contractor/subcontractor using an aerial lift on a Whiting-Turner project must comply with 29 CFR §1926.453, in addition to the following guidelines.

Procedures

- Only authorized and trained individuals may operate aerial lifts. Companies will make verification of training available to Whiting-Turner upon request.
- Aerial lifts shall be inspected by the trained operator each day prior to use, in accordance with the manufacturer's requirements.
- All aerial and scissor lifts shall be tagged according to Whiting-Turner's scaffold tagging policy
- Fall protection requirements for aerial lift use shall comply with the manufacturer's recommendations.
- Worker must use personal fall arrest systems (PFAS) or personal fall restraint systems (PFRS)—whichever the manufacturer requires—when working from articulating boom platforms.
- Workers must keep both feet on the floor of the basket; use of guardrails or toe boards to gain additional height is prohibited on Whiting-Turner projects. Persons observed committing this unsafe act will be removed from site for a minimum of 3 days; their employer must retrain them prior to their return to the site.
- Where aerial and scissor lifts are used on concrete slabs, any floor depressions or grade changes are required to be barricaded to restrict travel onto that area.
- The area(s) below the basket or platform of aerial lifts shall be cordoned off using reinforced danger tape—or something of equivalent or greater tensile strength—and by using signage to identify the overhead hazard if/when the possibility of falling objects exist.
- Field modifications are not allowed on aerial lifts. Aerial lifts shall not be used to hoist, raise, or position material outside of the platform or basket unless manufactured to do so.

1.19. Motor Vehicles, Mechanized Equipment, and Marine Operations Policy

Introduction

Each contractor/subcontractor working on a Whiting-Turner project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart O – Motor Vehicles, Mechanized Equipment, and Marine Operations in addition to the following guidelines.

Procedures

- All operations requiring the use of heavy equipment will require a pre-planning meeting, contractors/subcontractors must include strategies to prevent injuries to tradespersons and the public.

- All fuel driven equipment being used indoors or in partially enclosed spaces—that does not meet the Final Tier 4 engine requirements—must have scrubbers where the potential for carbon monoxide overexposure exists.

- Equipment meeting the Final Tier 4 emissions standards are permitted—continuous air monitoring for the concentration of CO is required.

- Keys are to be removed at the end of the shift and cab doors locked.

- All material handling equipment, with an obstructed view to the rear, must have a back-up alarm that is functional and distinctly audible.

- A "spotter", wearing an ANSI approved high visibility traffic vest, may be used in lieu of an alarm, but only if such devices are not routinely supplied on such a vehicle. Vehicles must never back "blind" on a Whiting-Turner project.

- If the competent person determines that the back-up alarm is not sufficient, a spotter must be present to help facilitate the rear operation of the equipment.

- Equipment and dump trucks equipped with faulty back-up alarms shall be repaired within 24hrs or taken out of service until back-up alarms are repaired. During that 24hr period, to remain in service, a spotter must be present to help facilitate the rear operation of the equipment.

- Forklift operator training records must be submitted to the Whiting-Turner project team prior to site use.

- A seatbelt must be provided and used when operating equipment on a Whiting-Turner project.

- All windows must be in full working condition. Any equipment with broken glass of any size, including mirrors will be taken out of service.

- Equipment without a rollover protective structure (ROPS) or seatbelt is not allowed on any Whiting-Turner project unless it was manufactured in such a way and determined to be more hazardous with such protections.

- Use of cell phones and radios are not permitted while operating machinery.

- No one may work within 20' of motorized equipment like an excavator, backhoe, loader etc. unless that person's presence is fundamental to the operation underway and the operator can observe the person at all times.

- All equipment with a rotating superstructure shall have swing radius protection or a designated spotter.

Hoisting personnel.

- Personnel hoisting requirements - The use of load handling equipment to hoist personnel is prohibited unless the employer can demonstrate that other methods would be more hazardous and is able to comply with the personnel hoisting requirements that are established in the standard.
- Hoisting personnel on Whiting-Turner project sites shall be done only after review of the plan and deemed feasible by Vice President and the Area EH&S Manager assigned to the project.
- Hoisting personnel on Whiting-Turner projects shall be considered a critical lift or activity, and therefore shall meet all requirements of a critical lift before the lift may begin.

1.20. Personal Protective Equipment

Introduction

All Whiting-Turner and contractor/subcontractor employees on Whiting-Turner projects must wear all the personal protective equipment necessary to complete their jobs safely. Mandatory personal protective equipment required on the project site includes, but is not limited to, hardhat, safety glasses, high visibility vests, and sturdy leather work boots. A competent person onsite will determine additional necessary equipment. Each contractor/subcontractor working on a Whiting-Turner project site will comply with 29 CFR 1926, Construction Industry Regulations, Subpart E – Personal Protective and Lifesaving Equipment; in addition to the following guidelines.

Procedures

- All Whiting-Turner employees, contractor/subcontractor employees and visitors to project sites are required to wear safety glasses that comply with ANSI Z87.1.
    - Dark lenses are not to be worn inside of buildings, in enclosed areas, or at night.
    - Tinted lenses must be worn on light colored membrane roofs.
    - Prescription eyeglasses and sunglasses that do not comply with ANSI Z87.1 are prohibited.
    - A full-face shield is required while grinding concrete.
    - Face shields are required for: welding, burning, and cutting; using abrasive wheels; chop saws; portable grinders or files, chippings concrete, stone, or metal; drilling or working under dusty conditions; using explosive actuated fastening or nailing tools; overhead work; work with hazardous liquids or gases.
    - Face shields must be compatible with a hard hat.

- All Whiting-Turner employees, contractor/subcontractor employees and visitors to project sites are required to wear hardhats that comply with ANSI Z89.1.
    - Aluminum hardhats, and bump caps are not permitted on Whiting-Turner projects.
    - For security and identification purposes, all hardhats shall display the contractor/subcontractor name and/or decal indicating for whom the employee works as well as the employee's name.
    - Employees exposed to electrical voltages of 600V or greater shall wear hardhats that meet the requirements of ANSI Z89.2 type hardhats.

- All Whiting-Turner employees, contractor/subcontractor employees and visitors to project sites are required to wear substantial leather work boots.
    - Employees working with jackhammers, tampers and similar equipment are required to utilize metatarsal guards over their work boots.

- Where necessary, each employee shall use equipment with filter lenses that have a shade number appropriate for the work being performed for protection from injurious light radiation.

- Hand protection is required when employee's hands are exposed to hazards such as those from skin absorption of harmful substances, cuts or lacerations, abrasions, punctures, chemical burns, thermal burns, and harmful temperature extremes.

- Workers exposed to roofing tar must wear long sleeved shirts and gloves. Workers who are directly exposed to hot tar must also wear a full apron and face shield.

- Personal protective equipment labeled "WT" or Whiting-Turner" is reserved for the use of Whiting-Turner employees only.

Roles and Responsibilities

Contractor/subcontractor management shall
- provide necessary PPE and training,
- monitor use of PPE,
- provide replacement PPE when needed,
- identify any new hazards that would require the use of PPE; and
- be responsible for the assurances of PPE adequacy, maintenance, and sanitation.

Contractor/subcontractor employees shall
- properly use and care for assigned PPE and
- immediately inform supervisor if PPE is damaged or not effective.

1.21. Respiratory Protection

Any contractor/subcontractor with employees who are required to wear respiratory protection must submit their company's respiratory protection program prior to start of work. Compliance with this requirement applies to filtering face-piece respirators (N95 Respirators) as well.

All programs shall meet or exceed Whiting-Turner policies as well as the most current federal, state, and local regulatory requirements.

1.22. Sanitation Guidelines

Introduction

Each contractor working on a Whiting-Turner project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart D - Occupational Health and Environmental Controls; employers shall establish and maintain basic sanitation provisions for all employees in all places of employment as specified in the following paragraphs.

Procedures

Drinking water supply.

- An adequate supply of drinking water shall be provided; cool water shall be provided during hot weather.
- Only approved potable water systems shall be used for the distribution of drinking water.
- Portable drinking water dispensers shall be designed, constructed, and serviced to ensure sanitary conditions; shall be capable of being closed, and shall have a tap.
- Containers shall be clearly marked as "drinking water" and shall not be used for other purposes.
- Workers shall use cups when drinking from portable water coolers/containers.
- Unused disposable cups shall be kept in sanitary containers and a waste receptacle shall be provided for used cups.

Non-potable water.

- On outlets dispensing non-potable water, signs cautioning that the water is unsafe for drinking, washing, or cooking will be conspicuously posted

Toilets.

- When sanitary sewers are not available, one of the following facilities, unless prohibited by local codes, shall be provided: chemical toilets, recirculating toilets, or other toilet systems as approved by state/local governments.
- Each toilet facility shall be equipped with a toilet seat and toilet seat cover. Each toilet facility - except those specifically designed and designated for females - shall be equipped with a metal, plastic, or porcelain urinal trough. All shall be provided with an adequate supply of toilet paper and a holder for each seat.
- Toilet facilities shall be so constructed that the occupants shall be protected against weather and falling objects; all cracks shall be sealed, and the door shall be tight-fitting, self-closing, and capable of being latched.
- One toilet facility shall be provided for every ten (10) persons on site.
- Separate toilet facilities shall be provided for each sex.
- Provisions for routinely servicing and cleaning all toilets and disposing of the sewage shall be established before placing toilet facilities into operation.

Washing facilities.

- Washing facilities shall be provided at toilet facilities and as needed to maintain healthful and sanitary conditions.
- Each washing facility shall be maintained in a sanitary condition and provided with water (either hot and cold running water or tepid running water), soap, and individual means of drying. However, where it is not practical to provide running water, hand sanitizers may be used as a substitute.
- Whenever employees are required by a standard to wear protective clothing, change rooms with storage facilities for street clothes and separate storage facilities for protective clothing shall be provided.

Vermin control.

- Enclosed workplaces shall be constructed and maintained, as far as practical, to prevent the entrance or harborage of rodents, insects, and other vermin. An effective extermination program shall be instituted where the presence of such vermin is detected.

1.23. Scaffolds

Introduction

Each contractor/subcontractor working on a Whiting-Turner project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart L – Scaffolds, in addition to the following guidelines.

Procedures

- Scaffolds are required to be designed, erected, and inspected by a competent person in accordance with OSHA 1926 – Subpart L Scaffolding Standards.

- Contractors/subcontractors erecting scaffolding must submit a scaffold erection plan/drawing to the Whiting-Turner team showing a section view of necessary components including ties/braces, platforms and means of access.

- Employees erecting or dismantling a scaffold are required to utilize appropriate fall protection at heights six (6) feet or above unless proven to be infeasible or more hazardous as determined by their company's competent person.

- Base plates/screw jacks and mudsills or other adequate firm foundation are required to be used as part of a complete support scaffold.

- All scaffolds, including carpenters' bracket scaffolds, over six (6) feet in height shall have guardrails on all open sides, unless otherwise specified by the manufacturer. If guardrails cannot be used on a walking/working platform, contractors/subcontractors are required to use another means to protect employees from a fall.

- Cross-braces are not considered to be an adequate guardrail (fall protection) system and shall not be used as a top or mid rail on Whiting-Turner projects.

- Contractors shall comply with Whiting-Turner's scaffold tagging policy. The scaffold tag system shall be color coded and visible. The competent person shall inspect the scaffolding system before each work shift. The competent person shall sign and date the scaffold tag.
    - Green tags are reserved for complete systems
    - Red tags are reserved for erection/dismantling activities and for scaffolds with deficiencies in the system
    - Yellow tags are reserved for systems that require the use of both PFAS and guardrail systems for incomplete scaffold systems or platforms.

- Scaffold tags are required at each entry point of the scaffold system.

- Each contractor/subcontractor using the scaffold system shall have its competent person place a tag at each point of entry for their employees.

  - In the case of stair towers, the responsible party's competent person shall put the tags in place and inspect the stair towers daily.

- Fall protection is required when walking/working at six (6) feet or above.

- The scaffold erection competent person will consider/determine if a horizontal, diagonal brace shall be in place to prevent the scaffold from wracking.

- Scaffold working platforms are required to have a fully planked deck (5 planks). Walking platforms for use during the erection/dismantling of a scaffold are required to be at least two (2) planks wide.

- Walking/working surfaces are required to be made of scaffold grade planks. Planking is to be inspected by the competent person erecting the scaffold prior to installation during the scaffold erection. Damaged planks found during the initial inspection and all concurrent inspections are to be immediately removed from service and replaced.

- Walking/working surfaces are required to comply with the following.
  - Planking that does not extend at least six (6) inches past the bearing surface are required to be secured in such a manner to prevent accidental displacement.
  - Planking that is less than ten (10) feet in length is not to extend more than twelve (12) inches past the bearing surface and planking greater than ten (10) feet in length is not to extend past the bearing surface more than eighteen (18) inches without adequate barricades to prevent employees from stepping on the cantilevered end. Al planking must rest on bearers.

- Contractors/subcontractors are to provide a proper and safe access/egress for employees working on a scaffold. Only approved built-in scaffold stairs or ladders are to be used for access and egress while working on scaffolds.

- Contractors/subcontractors are required to load materials (brick, block, stone, etc.) as close to the load bearing surface as possible. Loading in the center of the scaffold bay is not permitted. Scaffolds shall be designed to support 4x the intended load; load capacity ratings shall not be exceeded.

- Contractors/subcontractors performing work on scaffolding are required to complete a daily scaffold inspection prior to allowing their employees on the scaffold. The above-mentioned inspection is required to be completed by an employee competent in scaffold safety.

- Contractors/subcontractors are responsible for training their employees and must submit the training documentation to Whiting-Turner upon request.

- Rolling/mobile scaffold systems 30" or less in width (baker-type scaffolds) are required to have guardrails on all sides unless otherwise specified by manufacturer or local jurisdiction having authority; all wheels are required to be locked when an employee is on the working

platform. Outriggers are required when the height of scaffold exceeds 3x the base width or according to the manufacturer's recommendation, whichever is more stringent. Self-propelling/skateboarding is not permitted.

- Suspended scaffolds shall be designed, constructed, operated, inspected, tested, and maintained as specified in the operating manual for the device; all operating instructions and design specification shall be submitted to the Whiting-Turner project team prior to installation and a copy shall remain on the jobsite.

1.24. Signs, Signals and Barricades

Introduction

All employees of the Whiting-Turner and its contractors/subcontractors will comply with 29 CFR 1926, Construction Industry Regulations, Subpart G, Signs, Signals and Barricades.

Procedures

- Signs must be posted to warn others that a temporary hazard exist in the area where the subcontractor is working.

- Barricades must be utilized to deter the passage of persons or vehicles when necessary.

- Required signs will comply with the OSHA standards described in 1926.200.

- Where areas may require additional awareness or present unique danger, the use of warning tape may be necessary.
    - For areas that require additional caution, (e.g. uneven surfaces, wet surfaces) yellow caution tape should be used. Caution tape does not prohibit access.
    - For areas where entry and travel are prohibited, (e.g. areas where fall protection is being erected or areas with overhead work being performed) red danger tape should be used. Danger tape is intended to prohibit access.
    - Caution/danger tape has limitations; therefore, it shall not be used in lieu of physical barricades when an occurrence calls for a physical barricade.
    - The intent of the warning tape is to notify of hazards that may arise during construction activities. Every effort must be made to correct these situations with permanent solutions in a timely fashion.
    - All caution and danger tape used on Whiting-Turner project sites shall be of the reinforced type and shall be supplemented with a tag/label affixed with the responsible party's name, company, contact number, and potential hazard.

- All flagmen shall be trained on appropriate procedures before controlling traffic, as required by the Manual on Uniform Traffic Control Devices (MUTCD) and any municipal or state guidelines.

- All flagmen shall utilize sign paddles and shall be outfitted with high visibility garments, as required by current ANSI standards. All PPE and traffic control equipment shall be outfitted with reflectorized material for night work as required by current ANSI standards.

- All crane and hoist signals shall comply with applicable ANSI standards.

- All traffic control devices shall comply with the MUTCD and any applicable Municipal or State guidelines.

- All signs shall be secured in such a way that would allow venting in the event of high winds.

1.25. Silica Exposure Control Plan

Exposure to silica can lead to silicosis, a serious and sometimes fatal respiratory disease. Silicosis develops from being exposed to and breathing in silica dust. Excessive amounts of silica dust may be generated during activities such as, but not limited to: sandblasting, rock drilling, roof bolting, foundry work, stonecutting, drilling, quarrying, brick/block/concrete cutting, gunite operations, lead-based paint encapsulate applications, asphalt paving, cement products manufacturing, demolition operations, hammering, and chipping and sweeping concrete or masonry, drywall sanding and concrete saw cutting.

Any contractor/subcontractor whose work potentially exposes their workers to silica above allowable limits is required to submit their company's Silica Exposure Control Plan to Whiting-Turner prior to start of work. The contractor's/subcontractor's plan must be in compliance with the requirements set forth in 29 CFR 1926.1153.

Releases of plumes of silica laden dust are prohibited on Whiting-Turner projects. Observation of such activities will require cessation of the task and a meeting with the creating contractor/subcontractor to determine what engineering or work practices need to be put in place to ensure these releases are reduced and/or eliminated as prescribed in their silica exposure control plan.

1.26. Stairways and Ladders

Introduction

Each contractor working on a Whiting-Turner project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart X – Stairways and Ladders, in addition to the following guidelines.

Procedures

General requirements.

- A stairway or ladder must be provided at all personnel points of access where there is a break in elevation of 19" or more.
- A double-cleated ladder or two or more separate ladders must be used when ladders are the only means of egress from a working area with 25 or more employees.
- All aluminum and commercially manufactured wooden ladders shall not be used on Whiting-Turner projects.

Stairways.

- When doors from an office or storage trailer open directly onto a stairway, a platform must be provided, and the swing of the door must allow an additional 20" to prevent the door from striking an employee.
- Workers are not allowed to use metal pan stairs unless they have been fitted with wooden filler blocks or poured with concrete.
- Incomplete/unsafe stairways must be physically blocked off to prevent unauthorized use; barricade tape would be an insufficient restrictive method.
- Stairways with four or more risers or rising more than 30", whichever is less, must have a handrail and a stair rail along each unprotected side or edge.

Ladders.

- All hazards must be evaluated by a competent person when employees are engaged in work from a ladder 6' or more above an adjacent surface.
- Fall protection shall be considered by the competent person if employees work from a ladder 6' or more above a lower level and are exposed to a fall.
- Employees working on ladders must be at least one and a half times the height of the ladder away from any perimeter, shaft, stairway, and opening where the fall distance exceeds 6' without employing additional means of fall protection.
- Contractors/subcontractors shall provide ladders with duty ratings that meet the needs of their employees.
- Workers are required to select ladders that are capable of safely supporting their weight and the weight of their tools.
- When employees ascend or descend a ladder, they must maintain three-points of contact (e.g. two hands and a foot or two feet and a hand).
- Pull ropes should be placed at all access ladders so employees can safely lift tools or equipment to upper levels.

- Stepladders must be opened fully and set level when in use.
- When ladders are used to access upper landings, the side rails must extend at least 3 feet above the landing and secured from displacement at the bottom and top.
- When ladders are used to access upper landings, a guardrail system/corral shall be placed around the opening through which the ladder is protruding.
- All ladders must be used for the purpose for which they were designed.
- The base of an extension and or straight ladder is to be placed 1 foot horizontal from the face of the surface for every 4 feet vertical.

Job made ladder requirements.

- Job made wooden ladders must meet ANSI ASC A.14.4-2009 specifications.

Training.

- Each worker involved in stair and ladder use must be trained by their company's competent person in the recognition and avoidance of stair and ladder hazards.

1.27. Steel Erection

Introduction

Each contractor/subcontractor working on a Whiting-Turner project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart R – Steel Erection. In addition to the items listed in this section, all contractors are to comply with all federal, state, and local requirements and codes including those in other sections of this Manual, and those imposed by the owner. All contactors shall be required to comply with all parts of these requirements based on their scope of work.

Procedures

This section set forth requirements to protect tradespersons from hazards associated with steel erection activities involved in construction.

When floors are ready for turn over the steel erection contractor must notify Whiting-Turner. Whiting-Turner will evaluate the installation and condition of the guardrail cable system provided by the steel erector and decide to accept custody of the system or to have the system removed.

The steel erection contractor has a responsibility to inspect and control fall protection in their work areas based on their scope of work.

Structure steel design.

- Column anchorage
  - All columns shall be anchored by a minimum of four (4) anchor bolts.
  - When two structural members on opposite sides of a column web, or a beam web over a column, are connected sharing common connection holes, at least one bolt with its wrench-tight nut shall remain connected to the first member unless a shop-attached or field-attached seat or equivalent connection device is supplied with the member to secure the first member and prevent the column from being displaced. If a seat or equivalent device is used, the seat (or device) shall be designed to support the load during the double connection process. It shall be bolted or welded to both a supporting member and the first member before the nuts on the shared bolts are removed to make the double connection.
  - The perimeter columns have holes or other devices in or attached to perimeter columns at 42-45 inches above the finished floor and the midpoint between the finished floor and the top cable to permit installation of perimeter safety cables. Welded nuts are not permitted as part of the perimeter safety fall protection system.

General requirements.

- Pre-Steel Construction Meeting
  - A pre-steel construction meeting shall be held prior to beginning steel erections on our projects. This meeting will be held with all parties involved in steel erection activities including but not limited to the following: steel erector, steel

fabricator, owner and/or owner representative and architect and/or structure engineer.

- This pre-construction meeting will address issues and items relating to all activities to steel erection including but not limited to the following:
  1. Adequate access roads shall be provided into and through the site for the safe delivery and movement of derricks, cranes, trucks, other necessary equipment, and the material to be erected and means and methods for pedestrian and vehicular control.
  2. A firm, properly graded, drained area, readily accessible to the work with adequate space for the safe storage of materials and the safe operation of the erector's equipment shall also be provided.
  3. The Steel Erector must be prepared to notify Whiting-Turner of the compaction requirements necessary to adequately support the crane at 360° capacities.
  4. Written notification that the concrete in footings, piers and walls and the mortar in the masonry piers and walls has attained 75 percent of the intended minimum compressive design strength, based on the appropriate ASTM standard test methods performed by Whiting-Turner's 3rd party testing agency. The steel erection contractor shall not erect steel until it has received the written notification.
  5. Pre-planning steel erection actives to ensure hoisting of structure steel avoid hazards associated with overhead operation.

- Site specific erection plans are to be posted and must including the following topics:
  - Material deliveries, material staging and storage
  - Coordination with other trades and construction activities.
  - Path for overhead loads
  - Critical lifts, including rigging supplies and equipment.
  - A description of steel erection activities and procedures
  - Stability considerations requiring temporary bracing and guying
  - Erection bridging terminus point
  - Columns and beams connections
  - Decking installation
  - Ornamental and miscellaneous iron.
  - Procedures that will be used to comply with protection from falling objects.
  - Special procedures required for hazardous non-routine tasks.

Repairs and/or modifications.

- Prior to the erection of a column, Whiting-Turner shall provide written notification to the steel erector if there has been any repair, replacement, or modification of the anchor bolts of that column.
- Anchor bolts shall not be repaired, replaced or field-modified without the approval of the project structural engineer of record.
- Columns shall be set on level finished floors, pre-grouted leveling plates, leveling nuts, or shim packs which are adequate to transfer the construction loads.

Fall protection.

- Fall Protection shall be installed and/or used along all edges of structure that are six (6) feet or more in height and shall remain in the area where the steel erection activity has been completed for Whiting-Turner to decide to accept custody or direct removal.
- All tradespersons, including connectors, engaged in steel erection activities on a walking/working surface with an unprotected side or edge more than six (6) feet above a lower level shall be protected from fall hazards by a conventional fall protection method.
- All hoisting operations in steel erection shall be pre-planned to ensure that the project requirements are met for employee protection.
- Other construction processes below steel erection are prohibited unless overhead protection for the employees below is provided.
- Full body harnesses are required for fall arrest and these harnesses require daily inspections of this equipment.
- Fall protection is required in baskets of aerial lifts.
- Roof penetrations are to be made only when equipment is ready to be installed. Later removal of the decking will require the use of an elevated surface modification permit.
- On multi-story structures, perimeter safety cables shall be installed at the final interior and exterior perimeters of the floors as soon as the metal decking has been installed.
- All materials, equipment, and tools, which are not in use while aloft, shall be secured against accidental displacement.

Cranes.

- Each contractor is responsible for complying and providing documentation based on the following requirements and providing a description of the crane selection and placement procedures.
- All operators shall submit to documentation showing that they meet the requirements to operate the crane provided.
- A description of the crane and placement procedures shall be submitted in writing to Whiting-Turner prior to delivery of this equipment.
- Each crane shall have a current annual inspection conducted by a third party and document shall be submitted to the Whiting-Turner project team.
- Cranes are to have the following in cab areas; load charts, manufacture manual, fire extinguisher and hand signal poster.
- Operator shall perform daily inspections on the crane that they will operate.
- The operator shall not operate the crane until the counter weight is properly barricaded as per OSHA standards.
- Each contractor is required to inspect the rigging equipment that will be used before each lift, and prior to placing that equipment in service, such as; grab hooks, spreader bars, extension devices, slings, and wire ropes, etc.

Structural steel erection.

- Beams and columns

- During the final placing of solid web structural members, the load shall not be released from the hoisting line until the members are secured with at least two bolts per connection, of the same size and strength as shown in the erection drawings, drawn up wrench-tight as specified by the project structural engineer of record.
- A competent person shall determine if more than two bolts are necessary to ensure the stability of cantilevered members; if additional bolts are needed, they shall be installed.
- Solid web structural members used as diagonal bracing shall be secured by at least one bolt per connection drawn up wrench-tight or the equivalent as specified by the project structural engineer of record.

- Hoisting and rigging
  - The steel erection contractor shall ensure that all the following provisions are complied with as applicable to hoisting and rigging.
  - A competent person shall visually inspect cranes being used in steel erection activities prior to each shift; the inspection shall include observation for deficiencies during operation. At a minimum this inspection shall include the following:
    1. All control mechanisms for maladjustments
    2. Control and drive mechanism for excessive wear of components and contamination by lubricants, water, or other foreign matter.
    3. Safety devices, including but not limited to boom angle indicators, boom stops, boom kick out devices, anti-two block devices, and load moment indicators where required.
    4. Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those that flex in normal operation.
    5. Hooks and latches for deformation, chemical damage, cracks, or wear.
    6. Wire rope reeving for compliance with hoisting equipment manufacturer's specifications.
    7. Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, or moisture accumulation.
    8. Hydraulic system for proper fluid level
    9. Ground conditions around the hoisting equipment for proper support, including ground settling under and around outriggers, ground water accumulation, or similar conditions.
    10. The hoisting equipment for level position; and the hoisting equipment for level position after each move and setup.
  - If any deficiency is identified, the competent person shall make an immediate determination as to whether the deficiency constitutes a hazard.
  - If the deficiency is determined to constitute a hazard, the hoisting equipment shall be removed from service until the deficiency has been corrected.
  - The operator shall be responsible for those operations under the operator's direct control. Whenever there is any doubt as to safety, the operator shall have the authority to stop and refuse to handle loads until safety has been assured.

- A qualified rigger (a rigger who is also a qualified person) shall inspect the rigging prior to each lift.
- The headache ball, hook or load shall not be used to transport personnel except unless all the OSHA standards are being met to hoist employees on a personnel platform and written approval has been granted by executive management (See Cranes).
- Safety latches on hooks shall not be deactivated or made inoperable.

- Working under loads

  Routes for suspended loads shall be pre-planned to ensure that no employee is required to work directly below a suspended load except for:
  - Employees engaged in the initial connection of the steel; or
  - Employees necessary for the hooking or unhooking of the load.
  - When working under suspended loads, the following criteria shall be met:
    1. Materials being hoisted shall be rigged to prevent unintentional displacement;
    2. Hooks with self-closing safety latches or their equivalent shall be used to prevent components from slipping out of the hook; and
    3. A qualified rigger shall rig all loads

- Structural steel assembly
  - Structural stability shall be maintained during the erection process.
  - The following additional requirements shall apply for multi-story structures:
    1. The permanent floors shall be installed as the erection of structural members progress, and there shall be not more than eight stories between the erection floor and the upper-most permanent floor, except where the structural integrity is maintained because of the design.
    2. At no time shall there be more than four floors or 48 feet, whichever is less, of unfinished bolting or welding above the foundation or uppermost permanently secured floor, except where the structural integrity is maintained because of the design.
    3. A fully planked or decked floor or nets shall be maintained within two stories or 30 feet, whichever is less, directly under any erection work being performed.

- Plumbing-up
  - The steel erector shall evaluate to determine whether guying or bracing is needed; if guying or bracing is needed and if determined, it shall be installed.
  - When deemed necessary by a competent person, plumbing-up equipment shall be installed in conjunction with the steel erection process to ensure the stability of the structure.
  - When used, plumbing-up equipment shall be in place and properly installed before the structure is loaded with construction material such as loads of joists, bundles of decking or bundles of bridging.

- Plumbing-up equipment shall be removed only with the approval of a competent person.
- Hoisting, landing, and placing of metal decking bundles.
- Bundle packaging and strapping shall not be used for hoisting unless specifically designed for that purpose.
- If loose items such as dunnage, flashing, or other materials are placed on the top of metal decking bundles to be hoisted, such items shall be secured to the bundles.
- Bundles of metal decking on joists shall be landed in accordance with OSHA standards.
- Metal decking bundles shall be landed on framing members so that enough support is provided to allow removal of banding without dislodging the bundles from the supports.
- At the end of the shift or when environmental or jobsite conditions require, metal decking shall be secured against displacement.

- Roof and floor holes and opening
  - Metal decking at roof and floor holes and openings shall be installed as follows:
    1. Metal deck openings shall have structural members turned down to allow continuous deck installation except where not allowed by structural design constraints or constructability.
    2. Roof and floor holes and openings shall be decked over. Where large size, configuration or other structural design does not allow openings to be decked over (such as elevator shafts, stair wells, etc.) employees shall be protected in accordance with OSHA standards.
    3. Metal decking holes and openings shall not be cut until immediately prior to being permanently filled with the equipment or structure needed or intended to fulfill its specific use and which meets the strength requirements of this section policy or shall be immediately covered.

- Covering roof and floor openings
  - Covers for roof and floor openings shall be capable of supporting, without failure, twice the weight of the employees, equipment and materials that may be imposed on the cover at any one time.
  - All covers shall be secured when installed to prevent accidental displacement by the wind, equipment, or employees.
  - All floor holes greater than 12” x 12” must have a Whiting-Turner floor hole cover sign in place. Smaller holes shall be labeled “hole” in accordance with the OSHA standard.
  - Particle board, medium density fiber board (MDF) or similar material is prohibited from being used as floor hole covers on Whiting-Turner projects.
  - Smoke dome or skylight fixtures that have been installed are not considered covers for the purpose of this section unless they meet the strength requirements.

- Decking gaps around columns
  - Wire mesh, exterior plywood, or equivalent, shall be installed around columns where planks or metal decking do not fit tightly.
  - The materials used must be of sufficient strength to provide fall protection for personnel and prevent objects from falling through.

- Installation of metal decking
  - Metal decking shall be laid tightly and immediately secured upon placement to prevent accidental movement or displacement.
  - During initial placement, metal decking panels shall be placed to ensure full support by structural members.

- Erection of steel joists
  - Both sides of the seat of one end of each steel joist that requires bridging under OSHA requirements shall meet those requirements set forth in Tables A and B shall be attached to the support structure before hoisting cables are released.
  - For joists over 60 feet, both ends of the joist shall be attached as specified in the OSHA regulations before the hoisting cables are released.
  - Connections shall be drawn up, wrench tight with 2 bolts minimum before releasing the load.
  - On steel joists that do not require erection bridging under Tables A and B, only one employee shall not be allowed on the joist until all bridging is installed and anchored.
  - Employees shall not be allowed on steel joists where the span of the steel joist is equal to or greater than the span shown in Tables A and B of subpart R.
  - When permanent bridging terminus points cannot be used during erection, additional temporary bridging terminus points are required to provide stability.
  - Bar joists unless specified by the engineer of record shall not be used as fall protection anchorage points.

- Training

  The requirements in this section are mandatory and the contractor shall provide certification for each employee who has received training for performing steel erection operations based upon OSHA standards.

- Competent person

  Each contractor shall list the qualified and competent persons based on OSHA definition and the steel erector shall have a competent person knowledgeable of current OSHA standards with an OSHA 30-hour certification. This person shall remain on site during the completion of their work activities. If the contractor/subcontractor uses lower tier steel erectors to erect steel onsite the contractor/subcontractor with whom Whiting-Turner holds the contract must provide an onsite competent person to direct their lower tier contractor.

- Fall hazard training

The contractor shall provide a training program for all employees exposed to fall hazards. The program shall include but not limited to the following training and instructions in the following areas:

- The recognition and identification of fall hazards in the work area;
- The use and operation of guardrail systems (including perimeter safety cable systems), personal fall arrest systems, positioning device systems, fall restraint systems, safety net systems, and other protection to be used;
- The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;
- The procedures to be followed to prevent falls to lower levels and through or into holes and openings in walking/working surfaces and walls; and
- The fall protection requirements of this subpart.

- Additional training requirements

  In addition to the training requirements above in this section, the contractor shall provide special training to employees engaged in the following activities.

  - Multiple Lift Rigging Procedure - The contractor shall ensure that each employee who performs multiple lift rigging has been provided training in the following areas:
    1. The nature of the hazards associated with multiple lifts; and
    2. The proper procedures and equipment to perform multiple lifts.
    3. Multiple lifts must utilize a multiple lift rigging assembly and meet all other criteria as listed in OSHA standards regarding multiple lifts.
  - Connector Procedures - The contractor shall ensure that each connector has been provided training in the following areas:
    1. The nature of the hazards associated with connecting; and
    2. The establishment, access, proper connecting techniques and work practices.

1.28. Temporary Facilities

Introduction

Contractor/subcontractor providing temporary construction buildings, facilities, fencing, and access routes and anchoring systems for temporary structures shall be submitted to the Whiting-Turner project team for review.

Procedures

- The design and construction of temporary structures shall consider the following loadings:
  - Dead and live loads
  - Soil and hydrostatic pressures
  - Wind loads
  - Rain and snow loads
  - Seismic forces

- Trailers and other temporary structures used as field offices, to house personnel, or for storage shall be anchored with rods and cables or by steel straps to ground anchors. The anchor system shall be designed to withstand winds and must meet applicable State or local standards for anchoring mobile trailer homes.

- Fencing and warning signs
  - Temporary project fencing shall be installed per Whiting-Turner's fencing policy particularly on all projects located in areas of active use by members of the public. More careful consideration will also be given to those areas proximate to family housing areas and/or school facilities.
  - Signs warning of the presence of construction hazards and requiring unauthorized persons to keep out of the construction area shall be posted on the fencing. At the minimum, posting shall be on all fenced sides of the project and spaced one sign every 100 feet.

1.29. Underground Construction, Caissons, Cofferdams and Compressed Air Policy

Introduction

Each contractor working on a Whiting-Turner project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart S – Underground Construction, Caissons, Cofferdams and Compressed Air, in addition to the following guidelines.

Procedures

- The employer must control access to all openings to prevent unauthorized entry underground.
- Unused chutes, manways, or other openings must be tightly covered, bulk headed, or fenced off and must be posted with warning signs stating, "Keep Out", or similar language.
- The employer must assign and submit the qualifications of the competent person responsible for monitoring the air quality during underground construction.
- The atmosphere in all underground work must be tested as often as necessary to assure that the atmosphere contains at least 19.5% oxygen, but no more than 23.5% oxygen. These tests must be conducted before testing for air contaminants.
- The atmosphere in all underground work must also be tested quantitatively for hazardous materials such as carbon monoxide, nitrogen dioxide, hydrogen sulfide, and other toxic gases, dusts, vapors, mists, and fumes.
- If an IDLH (Immediately Dangerous to Life and Health) atmosphere is present, the caisson then becomes a permit required confined space and exposed/controlling contractor's Confined Space Entry program is implemented.
- The competent person must keep a daily record of all air quality test results and submit those results to Whiting-Turner, upon request.
- Casing or bracing must support the full depth of the shaft.
- The casing or bracing must extend 42" + or – 3" above ground level. This height may be reduced to 12", provided a standard railing is installed, the ground surrounding the shaft is sloped away from the shaft and effective barriers are in place to prevent mobile equipment from jumping over the 12" barrier.

1.30. Welding and Cutting Policy

Introduction

All Whiting-Turner employees and all contractor/subcontractor employees working on a Whiting-Turner project must comply with 29 CFR 1926, Construction Industry Regulations, Subpart J – Welding and Cutting, in addition to the following guidelines.

Procedure

- The contractor/subcontractor will assure that adequate precautionary measures have been taken to protect all personnel and property from contact with flash or contact with falling slag and sparks.

- Welders, cutters, and their supervisor shall be trained in the safe operation of their equipment, safe welding/cutting practices, and welding/cutting respiratory and fire protection.

- All contractors performing welding, burning/cutting operations shall submit an AHA to the Superintendent prior to the commencement of work.

- Contractors/subcontractors are required to use welding shields between the welding operation and the public/other trades for protection against arc flash.

- All welding lead connection lugs are required to have non-conductive boot covers installed.

- A Hot Work Permit must be completed daily by each contractor/subcontractor performing all welding, burning/cutting operations.
    - The hot work permit will designate the location of the operation, date of the operation, type of work to be done and the time commenced and completed.
    - A hot work permit is required to be submitted by the contractor/subcontractor prior to beginning the hot work activity.
    - The hot work permit shall be conspicuously located near the area where the activity is taking place.
    - Contractors/subcontractors are responsible for providing a charged, 20lb ABC dry chemical fire extinguisher for each welding and burning activity.
    - Other hot work activities besides welding and burning may require the use of a fire watch, as designated by Whiting-Turner.
    - Whiting-Turner life safety fire extinguishers shall not be used for fire watch duties.
    - A fire watch is to be positioned at each location where sparks/slag and/or molten metal can fall/drop/strike combustible material, potentially resulting in a fire.
    - A fire watch is required to remain in place at all times during the hot work activity and for a minimum of one half (1/2) hour after the welding or burning operation has been completed or longer periods of time as determined by the project-specific rules.

  - The fire watch is to be replaced by another fire watch if the person needs to leave the area for any reason.
  - Additional permits may be required by the local Fire Department and will be at the contractor's/subcontractor's expense.
  - Copies of these additional permits are to be submitted to the Whiting-Turner project team upon request.
  - Upon completion of the work, the completed hot work permit must be returned to Whiting-Turner for file retention.

- Local fire department fire details may be required, and all costs associated with the detail will be the responsibility of the contractor/subcontractor doing the hot work requiring the detail.

- Contractors/subcontractors may be required to provide adequate engineering controls (ventilation and/or smoke eaters) for welding and burning operations.

- Contractors/subcontractors performing welding and/or burning operations may be required to provide air monitoring in areas with adequate ventilation.

- All employees engaged in hot work activities shall wear the appropriate personal protective equipment (PPE); shields shall be compatible with a hardhat.

- Oxy-fuel gas welding shall have hoses that are readily distinguishable.

- Welding and cutting systems using cylinder-hose-torch shall have a reverse-flow check valve and a flash arrestor.

- Oxygen cylinders in storage shall be separated from fuel gas cylinders or combustible material by 20 feet or by a non-combustible barrier at least five (5) feet high having a fire-resistance rating of at least ½ hour.

- All cylinders shall be considered in storage at the end of each shift; cylinders must have gauges removed and caps in place.

- All compressed gas cylinders shall be secured against displacement by cinch straps or chains.

2. Premobilization Safety Submittals and Ongoing Safety Management

- Each contractor/subcontractor must identify (on the competent person acknowledgement form) and submit the qualifications of a competent person to Whiting-Turner prior to the start of work.

- Contractor/subcontractor shall submit a site-specific safety plan (SSSP) prior to start of work.
    - Activity hazard analyses (AHA) for major phases of work, submitted with company safety program may be accepted in lieu of SSSP—at the discretion of the Whiting-Turner project team.
    - Contractor/subcontractor supervisor is responsible to maintain a copy of these plans at the worksite and review with their employees for each new task or phase.

- Site specific safety data sheets (SDS) and chemical inventories are to be provided to Whiting-Turner prior to start of work.
    - SDS must be submitted for all hazardous chemicals/products to be used on the project.
    - Contractor/subcontractor supervisor is responsible to maintain copies of SDS and chemical inventory at the worksite.
    - Contractor/subcontractor supervisor is responsible for updating Whiting-Turner each time a new chemical is brought on site; the update must be reflected in their SDS binder and chemical inventory list.

- Each contractor/subcontractor is required to designate a site safety representative (SSR). SSR shall be on site at all times and shall have the knowledge and authority of the competent person. SSR shall be able to conduct site walks with Whiting-Turner personnel to ensure the safety of contractor's/subcontractor's workers on the project. Manpower totals below include all tiered contractor/subcontractor employees. Proof of training must be submitted prior to mobilization or at orientation. The qualifications for the SSR are as follows:
    - Minimum requirement proof of OSHA 30 hour submitted
    - Contractors/subcontractors with (30) or more workers on site will be evaluated by the Whiting-Turner's management team along with Whiting-Turner's EH&S Manager regarding the contractor's/subcontractor's site-specific safety performance. If the contractor's/subcontractor's past or current site safety performance indicates improved safe work practices and conditions are needed to help ensure the safety of the contractor/subcontractor crews and others, Whiting-Turner at its discretion, may require the contractor/subcontractor to provide a fulltime Site Safety Representative to be present onsite with no other collateral duties.

- Certification for operators of powered industrial trucks and cranes is required to be submitted to the Whiting-Turner project team prior to the operation of said equipment.

- All on site personnel, (contractor/subcontractors, tiered contractors/subcontractors, and their employees) are required to participate in a mandatory safety orientation session prior to commencing with any work on site. Contractor/subcontractor shall provide a translator for any non-English speaking employees during orientation and any job wide meetings/stand-downs. Employees may be asked to attend orientation again for repeat violations or deficiencies.

- Contractor/subcontractor shall conduct weekly safety meetings for all workers (employed or contracted). Whiting-Turner Superintendent and/or other Whiting-Turner personnel may attend this safety meeting.
    - Provide a legible sign-in sheet and meeting agenda to the Whiting-Turner field office at the conclusion of the meeting.
    - Contractor/subcontractor is also required to submit daily work reports to the Superintendent, on Whiting-Turner's form.

- In coordination with the contractor's/subcontractor's AHA, complete a Pre-task Plan (PTP) at least once per day, per crew/task.
    - PTPs shall be updated as hazards or conditions change. If necessary, a new PTP may be completed and reviews with the crew.
    - Copies of PTP(s) must be submitted to the Whiting-Turner project team upon request.
    - Tasks should be reviewed in the area where work is to be performed, and crew members should be involved in the development of the plan (safety "huddle").

- Documented pre-shift inspections are to be completed for mobile equipment, heavy equipment, and cranes.
    - Equipment is to be taken out of service for deficiencies noted.
    - These inspections are to be maintained in the work area for review.

3. Compliance Enforcement and Incentive Guidelines

Enforcement Guidelines.

Introduction:
In an effort to ensure compliance with this program and all other established OSHA standards, the Whiting-Turner Contracting Company has established this procedure of compliance enforcement for all contractors/subcontractors. This is established to promote safety excellence and eliminate offenders. This program may be used or may be superseded with more severe discipline based on the degree of the infraction(s). In any case, Whiting-Turner has sole authority in what type of discipline is issued relating to the project, up to and including removal from the project. Contractor/subcontractors are required to provide Whiting-Turner with any written disciplinary notices issued to site employees by their management.

To assist in our efforts to provide a safe work place, the following disciplinary plan shall be used on each Whiting-Turner project.

- 1st infraction: written warning; coach the employee.

- 2nd infraction: written warning and a meeting must be held between the employee, his/her supervisor and the Whiting-Turner Superintendent—or their designee.
    - A copy of the written warning is sent to the employee's company's office.
    - A written warning requires the contractor/subcontractor's supervisor to assure the employee has satisfactorily completed an appropriate training session related to the safety policy violated.
        1. This training must be completed within five (5) working days from issuance of the written warning. Until that training has occurred the employees shall not resume the same work activity.
        2. Proof of training or retraining shall be provided to Whiting-Turner.

- 3rd infraction the worker is removed from the project, indefinitely.

- If repeat occurrences with other crewmembers are found the supervisor of said crewmembers shall be subject to removal from the project.

- All warnings, verbal or otherwise, shall be documented in a log to be used as a reference point by the project team to track unsafe trends and to act as a tool to enhance safety.

It is the discretion of the Whiting-Turner project team to issue a monetary fine for safety violations. Violation fines may decrease or increase based on severity.

All fines collected shall be added to the project safety incentive program. Fines will be assessed to the employee's company. In addition to the above, Monthly Payment Applications/Invoices will be reduced for any fines resulting in these violations.

Fine Schedule

Failure to wear hard-hat, safety glasses, or another required PPE	$50 per occurrence
No protective system installed for trenching / excavation operations 5' and deeper	$1000 per occurrence
Removal of safety barricade, guardrail, or other protection and leaving area unattended	$1000 per occurrence
Removal of or failure to provide floor opening protection and/or leaving area unattended (includes manholes)	$1000 per occurrence
Employees not using proper or no fall protection	$1000 per occurrence
Unprotected energized electrical panel	$1000 per occurrence
Failure to protect from impalement hazards	$100 per occurrence
Failure to provide adequate or sufficient employee safety training	$200 per occurrence
Failure to properly store, secure or cap compressed gas cylinders	$500 per occurrence
Fire extinguisher and/or watch not provided for welding or cutting operations	$250 per occurrence
Improper access provided to scaffolding work platform.	$250 per occurrence
Inadequate housekeeping.	$250 per occurrence
Unsafe or damaged tools and/or power cords.	$250/Immediate Removal
All "non-communication music type" radios on the project.	$250/Immediate Removal
Metal ladders on the project.	$250/Immediate Removal
Failure to safely or properly use scissor and aerial lifts.	$500 per occurrence
Failure to properly use and/or set up ladders.	$250 per occurrence
Failure to provide ground fault circuit interrupters (GFCI)	$500 per occurrence
Observed littering on the jobsite	$100 per occurrence
Failure to prevent arc welding flash from the public and other trades.	$500 per occurrence
Any non-compliance of Whiting-Turner, federal or state OSHA Standards, and applicable NFPA, ANSI, ASME codes.	Up to $1000 per occurrence

Safety Incentive Program Guidelines.

Introduction:

The implementation of a project safety incentive program is at the discretion the Whiting-Turner project team. The project's safety awards and incentives will be based primarily upon the data collected during safety observations. All superintendents, project managers and safety managers are required to perform inspections.

There are two important aspects of safety award programs that need to be kept in mind:

1. Provide safety awards for safe behavior and for activities related to maintaining a safe work environment.
2. Make safety awards and incentives significant enough to support compliance but not significant enough to generate false reporting of safety data.

WT
WHITING-TURNER

SECTION 01 36 00 – QUALITY MANAGEMENT PLAN

PROJECT-SPECIFIC QUALITY MANAGEMENT PLAN

Effective January 2019, all contractors and subcontractors on Whiting-Turner's projects are expected to be in full compliance with all applicable requirements of Whiting-Turner's project-specific Quality Management Plan (QMP). A copy of this project-specific QMP has been provided to this contractor / subcontractor. If a copy of this QMP has not yet been received, this contractor / subcontractor must provide a written request to the lead Whiting-Turner Project Manager to obtain a copy.

The information contained in this QMP is not intended to serve as a substitute for the exercise of good engineering judgment by the engineers nor as a substitute for determinations made by contractors/subcontractors of appropriate manner and methods of operations and aspects of work under their control. This QMP is also not intended to be all inclusive or replace a contractor's or subcontractor's corporate or site-specific quality management plan and is not intended to, nor shall it, supersede any federal, state, local and other applicable laws, codes, rules, regulations, and/or practices. All contractor's and subcontractor's site-specific quality management plans must meet or exceed the requirements of the Whiting-Turner project-specific Quality Management Plan, the contract documents (including any applicable Owner Quality Management Plans referenced therein), and all federal, state, local and other applicable laws, codes, rules, regulations, and/or practices.

This QMP and all information contained herein is confidential and intended for the sole use of contractors and subcontractors on Whiting-Turner projects. Contractors/subcontractors are prohibited from distributing this information to any third parties. The Whiting-Turner Contracting Company expressly disclaims warranties for the information contained in this QMP and makes no representations to such third parties regarding the reliability, suitability, correctness, or completeness of such information. Whiting-Turner assumes no responsibility or liability and shall not be responsible and/or liable for damages or losses of any kind, including but not limited to direct, indirect, incidental, exemplary, special or consequential damages or losses, arising from, attributable to and/or resulting from the use of such information by third parties however caused and on any theory of liability, whether in contract, strict liability or tort.

END OF SECTION 01 36 00

SECTION 01 40 00

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. This 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.

C. Related Sections include the following:

1. Division 01 Section 01 32 00 "Construction Progress Documentation" for developing a schedule of required tests and inspections.
2. Division 01 Section 01 73 29 "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
3. Divisions 02 through 49 Sections for specific test and inspection requirements.

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 **Construction Manager**.

C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. **Approved mockups establish the standard by which the Work will be judged.**

D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

F. 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 industry standards.

G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

J. 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. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

K. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of **five** previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 SUBMITTALS

A. Qualification Data: 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.

B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

C. Reports: Prepare and submit certified written reports that 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.

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.

1.5 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. 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.

C. 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.

D. 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.

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 to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications 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. Requirement for specialists shall not supersede building codes and regulations governing the Work.

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 548; 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. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to the Architect**,** , with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

I. 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. Demonstrate the proposed range of aesthetic effects and workmanship.
4. 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.

5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

1.6 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 by the Owner.
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. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. 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.

1. 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.

2. Notify testing agencies at least **24** hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. 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 Division 01 Section "Submittal Procedures."

D. 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.

E. 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.

F. 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.

G. 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.

H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within **30** days of date established for **commencement of the Work**.

1. Distribution: Distribute schedule to Owner, Architect, **Construction Manager,** testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.7 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified **testing agency** to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 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. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 50 00

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. This Section includes requirements for

1. Temporary utilities, support facilities, and security and protection facilities.
2. Project Signage

B. Related Sections include the following:

1. Division 01 Section 01 10 00 "Summary of Work" for limitations on utility interruptions and other work restrictions.
2. Division 01 Section 01 33 00 "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
3. Division 01 Section 01 73 00 "Execution" for progress cleaning requirements.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, **Owner's construction forces,** Architect, testing agencies, and authorities having jurisdiction.

1.5 SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.6 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.7 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

A. 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.

2.2 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

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.

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: Use of Owner's existing water service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
   1. Use of Permanent Toilets: Use of Owner's existing **is not permitted**

D. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

E. 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.

F. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel.

   1. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
   1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
   2. Maintain support facilities until near Substantial Completion. 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: Provide temporary OR Use designated areas of Owner's existing parking areas for construction personnel.

D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

   1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
   2. Remove snow and ice as required to minimize accumulations.

E. Project Identification and Temporary Signs: Provide Project identification and other signs. Install signs where indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.

1. Provide temporary, directional signs for construction personnel and visitors.
2. Maintain and touchup signs so they are legible at all times.

F. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."

G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that 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 Division 01 Section "Summary."

B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

1. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

D. 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.

E. Site Enclosure Fence: **Before construction operations begin**, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: [As required to enclose entire Project site or portion determined sufficient to accommodate construction operations] [As indicated on Drawings].
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. **Provide Owner with one set of keys.**

F. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

3.5 PROJECT SIGN

A. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs. Allow for a minimum 4'-0" x 8'-0" sign with cutouts.

1. Engage an experienced sign painter to apply graphics for Project identification signs.
2. Comply with details indicated in drawing and color rendering to be provided by Architect.

B. 4. Paint sign panel and applied graphics with exterior-grade alkyd gloss enamel over exterior primer.

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. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary paving not intended for or acceptable for integration into permanent paving. 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, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 60 00

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. This 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; product substitutions; and comparable products.

B. Related Sections include the following:

1. Division 01 Section 01 23 00 "Alternates" for products selected under an alternate.
2. Division 01 Section 01 77 00 "Closeout Procedures" for submitting warranties for Contract closeout.
3. Divisions 02 through 49 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis-of-design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Form: Tabulate information for each product under the following column headings:

a. Specification Section number and title.
b. Generic name used in the Contract Documents.
c. Proprietary name, model number, and similar designations.
d. Manufacturer's name and address.
e. Supplier's name and address.
f. Installer's name and address.
g. Projected delivery date or time span of delivery period.
h. Identification of items that require early submittal approval for scheduled delivery date.

3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 6 copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.
4. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

B. 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 facsimile of form provided at end of Section.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified material or product cannot be provided.
b. Coordination information, including a list of changes or modifications 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. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. 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 lack of availability or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
l. 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 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

a. Form of Acceptance: Change Order.
b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "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, product selected shall be 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. 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 ensure compliance with the Contract Documents and to ensure 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. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. 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: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. 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. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
7. Or Equal or Comparable Product: Where products are specified by name and accompanied by the term "or equal" or "comparable product" or "or approved equal" or "or approved," comply with provisions in Part 2 "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.

8. Basis-of-Design Product: Where Specifications name a product and/or include a list of manufacturers, provide the specified 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 provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.
9. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

    a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.

10. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.

    a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
    b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received within 30 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.

B. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.

10. 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.

2.3 COMPARABLE PRODUCTS

A. Conditions: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

Advancement of Construction Technology

SUBSTITUTION REQUEST
(After the Bidding Phase)

Project: _____ Substitution Request Number: _____
_____ From: _____
To: _____ Date: _____
_____ A/E Project Number: _____
Re: _____ Contact For: _____

Specification Title: _____ Description: _____
Section: _____ Page: _____ Article/Paragraph: _____
Drawing Number and Title: _____ Details Numbered: _____

Proposed Substitution: _____
Manufacturer: _____
Address: _____
Phone: _____ Fax: _____
Trade Name: _____ Model No.: _____
Installer: _____ Phone: _____ Fax: _____
Address: _____

History: ☐ New Product ☐ 2-5 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____
_____

☐ Point-by-point comparative data attached - REQUIRED BY A/E

Reason for not providing specified item: _____
_____

Similar Installation:
Project: _____
Address: _____
Architect: _____ Phone No.: _____
Owner: _____ Phone No.: _____
Date Installed: _____

Proposed substitutions affects other parts of Work.
☐ No ☐ Yes; explain _____

Cost Savings to Owner for accepting substitution: _____ ($ _____).
Proposed Substitution changes Contract Time:
☐ No ☐ Yes (Add) (Deduct) _____ days.

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐

SUBSTITUTION REQUEST (Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachments: _____

_____

A/E's Review and Action

☐ Substitution approved – Make submittals in accordance with Specification Section 01330.
☐ Substitution approved as noted – Make submittals in accordance with Specification Section 01330.
☐ Substitution rejected – Use specified materials.
☐ Substitution Request received too late – Use specified materials

Signed by: _____ Date: _____

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E ☐ _____

_____

_____

_____

_____

Copyright 1996, Construction Specification Institute,
99 Canal Center Plaza, Suite 300 Alexandria, VA 22314

September 1996
CSI Form 13.1A

SECTION 01 73 00

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

1. Construction layout.
2. Field engineering and surveying.
3. General installation of products.
4. Coordination of Owner-installed products.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

B. Related Sections include the following:

1. Division 01 Section 01 31 00 "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
2. Division 01 Section 01 33 00 "Submittal Procedures" for submitting surveys.
3. Division 01 Section 01 73 29 "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
4. Division 01 Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 SUBMITTALS

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: 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 and other construction affecting the Work.

1. Before construction, verify the location and points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   a. Description of the Work.
   b. List of detrimental conditions, including substrates.
   c. List of unacceptable installation tolerances.
   d. Recommended corrections.
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. 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 **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, submit a Request for Information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.
1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 INSTALLATION

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

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. 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.

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

3.5 PROGRESS CLEANING

A. General: **Each Contractor** shall clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. 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 materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.
   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

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.

3.6 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 01 Section "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 73 29

CUTTING AND PATCHING

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. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:

1. Divisions 02 through 49 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

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 surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least **10** days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
3. Products: List products to be used and firms or entities that will perform the Work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.

6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. **Architect's** Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

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

1. Primary operational systems and equipment.
2. Air or smoke barriers.
3. Fire-suppression systems.
4. Communication systems.
5. Electrical wiring systems.

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

D. 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.

1.6 WARRANTY

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. **Concrete and Masonry**: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.

5. Proceed with patching after construction operations requiring cutting are complete.

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

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

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

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

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes: Administrative and procedural requirements for construction waste management activities.

1.2 DEFINITIONS

A. Construction, Demolition, and Land clearing (CDL) Waste: Includes all non-hazardous solid wastes resulting from construction, remodeling, alterations, repair, demolition and land clearing. Includes material that is recycled, reused, salvaged or disposed as garbage.

B. Salvage: Recovery of materials for on-site reuse, sale or donation to a third party.

C. Reuse: Making use of a material without altering its form. Materials can be reused on-site or reused on other projects off-site. Examples include, but are not limited to the following: Crushing or grinding of concrete for use as sub-base material. Chipping of land clearing debris for use as mulch.

D. Recycling: The process of sorting, cleaning, treating, and reconstituting materials for the purpose of using the material in the manufacture of a new product.

E. Source-Separated CDL Recycling: The process of separating recyclable materials in separate containers as they are generated on the job-site. The separated materials are hauled directly to a recycling facility or transfer station.

F. Co-mingled CDL Recycling: The process of collecting mixed recyclable materials in one container on-site. The container is taken to a material recovery facility where materials are separated for recycling.

G. Approved Recycling Facility: Any of the following:

1. A facility that can legally accept CDL waste materials for the purpose of processing the materials into an altered form for the manufacture of a new product.
2. Material Recovery Facility: A general term used to describe a waste-sorting facility. Mechanical, hand-separation, or a combination of both procedures, are used to recover recyclable materials.

H. Universal waste components (UWC) are as follows: electric motors, PCB ballasts, non PCB ballasts, capacitors, contactors, circuit breakers, elemental and liquid mercury containing articles, transformers, lead acid batteries, fluorescent light bulbs, and all HID light bulbs.

1.3 SUBMITTALS

A. Contractor shall develop a Waste Management Plan: Submit 3 copies of plan within 14 days of date established for the **Notice to Proceed**.

B. Contractor shall provide Waste Management Report: Concurrent with each Application for Payment, submit **3** copies of report.

1.4 PERFORMANCE REQUIREMENTS

A. General: Divert a minimum of **75%** CDL waste, by weight, from the landfill by one, or a combination of the following activities:

1. Salvage
2. Reuse
3. Source-Separated CDL Recycling
4. Co-mingled CDL Recycling

B. CDL waste materials that can be salvaged, reused or recycled include, but are not limited to, the following:

1. Acoustical ceiling tiles
2. Asphalt
3. Asphalt shingles
4. Cardboard packaging
5. Carpet and carpet pad
6. Concrete
7. Drywall
8. Fluorescent lights and ballasts
9. Land clearing debris (vegetation, stumpage, dirt)
10. Metals
11. Paint (through hazardous waste outlets)
12. Wood
13. Plastic film (sheeting, shrink wrap, packaging)
14. Window glass
15. Wood
16. Field office waste, including office paper, aluminum cans, glass, plastic, and office cardboard.

1.5 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of projects with similar requirements, that employs a LEED Accredited Professional, certified by the USGBC as waste management coordinator.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Conduct construction waste management activities in accordance with hauling and disposal regulations of all authorities having jurisdiction and all other applicable laws and ordinances.

D. Preconstruction Conference: Schedule and conduct meeting at Project site prior to construction activities.

1. Attendees: Inform the following individuals whose presence is required, of date and time of meeting.
   a. Owner
   b. Architect
   c. Contractor's superintendent
   d. Major subcontractors
   e. Waste Management Coordinator
   f. Other concerned parties.
2. Agenda Items: Review methods and procedures related to waste management including, but not limited to, the following:
   a. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
   b. Review requirements for documenting quantities of each type of waste and its disposition.
   c. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
   d. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
   e. Review waste management requirements for each trade.
3. Minutes: Record discussion. Distribute meeting minutes to all participants.
   Note: If there is a Project Architect, they will perform this role.

1.6 WASTE MANAGEMENT PLAN – Contactor shall develop and document the following:

A. Develop a plan to meet the requirements listed in this section at a minimum. Plan shall consist of waste identification, waste reduction plan and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight throughout the plan.

B. Indicate anticipated types and quantities of demolition, site-cleaning and construction waste generated by the project. List all assumptions made for the quantities estimates.

C. List each type of waste and whether it will be salvaged, recycled, or disposed of in an landfill. The plan should included the following information:

1. Types and estimated quantities, by weight, of CDL waste expected to be generated during demolition and construction.
2. Proposed methods for CDL waste salvage, reuse, recycling and disposal during demolition including, but not limited to, one or more of the following:
   a. Contracting with a deconstruction specialist to salvage materials generated,
   b. Selective salvage as part of demolition contractor’s work,
   c. Reuse of materials on-site or sale or donation to a third party.

3. Proposed methods for salvage, reuse, recycling and disposal during construction including, but not limited to, one or more of the following:
   a. Requiring subcontractors to take their CDL waste to a recycling facility;

b. Contracting with a recycling hauler to haul recyclable CDL waste to an approved recycling or material recovery facility;
c. Processing and reusing materials on-site;
d. Self-hauling to a recycling or material recovery facility.

4. Name of recycling or material recovery facility receiving the CDL wastes.
5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on project site where materials separation will be located.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
1. Total quantity of waste.
2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
3. Total cost of disposal (with no waste management).
4. Revenue from salvaged materials.
5. Revenue from recycled materials.
6. Savings in hauling and tipping fees by donating materials.
7. Savings in hauling and tipping fees that are avoided.
8. Handling and transportation costs. Including cost of collection containers for each type of waste.
9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT, GENERAL

A. Provide containers for CDL waste that is to be recycled clearly labeled as such with a list of acceptable and unacceptable materials. The list of acceptable materials must be the same as the materials recycled at the receiving material recovery facility or recycling processor.

B. The collection containers for recyclable CDL waste must contain no more than 10% non-recyclable material, by volume.

C. Provide containers for CDL waste that is disposed in a landfill clearly labeled as such.

D. Use detailed material estimates to reduce risk of unplanned and potentially wasteful cuts.

E. To the greatest extent possible, include in material purchasing agreements a waste reduction provision requesting that materials and equipment be delivered in packaging made of recyclable material, that they reduce the amount of packaging, that packaging be taken back for reuse or recycling, and to take back all unused product. Insure that subcontractors require the same provisions in their purchase agreements.

F. Conduct regular visual inspections of dumpsters and recycling bins to remove contaminants.

3.2 SOURCE SEPARATION

A. General: Contractor shall separate recyclable materials from CDL waste to the maximum extent possible.

Separate recyclable materials by type.

1. Provide containers, clearly labeled, by type of separated materials or provide other storage method for managing recyclable materials until they are removed from Project site.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water and to minimize pest attraction. Cover to prevent windblown dust.
3. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from weather.

3.3 CO-MINGLED RECYCLING

A. General: Do not put CDL waste that will be disposed in a landfill into a co-mingled CDL waste recycling container.

3.4 REMOVAL OF CONSTRUCTION WASTE MATERIALS

A. Remove CDL waste materials from project site on a regular basis. Do not allow CDL waste to accumulate on-site.

B. Transport CDL waste materials off Owner's property and legally dispose of them.

C. Burning of CDL waste is not permitted.

3.5 UNIVERSAL WASTE DIVERSION

A. Remove all universal waste from fixtures, panels, and related devices for proper diversion and reclamation.

B. Store all universal waste in containers provided by contact person within facilities operations.

C. Store all universal waste in a secured location and request periodic removal from assigned contact person.

D. Exemption: electric motors, circuit breakers, transformers and lighting contactors are exempt from this provision provided the contractor chooses to salvage or reuse the components.

E. No identified universal waste will be discarded into the waste stream.

END OF SECTION

WASTE MANAGEMENT PROGRESS REPORT				
	DISPOSED IN MUNICIPAL SOLID WASTE LANDFILL	**DIVERTED FROM LANDFILL BY RECYCLING, SALVAGE OR REUSE**		
MATERIAL CATEGORY		Recycled	Salvaged	Reused
1. Acoustical Ceiling Tiles				
2. Asphalt				
3. Asphalt Shingles				
4. Cardboard Packaging				
5. Carpet and Carpet Pad				
6. Concrete				
7. Drywall				
8. Fluorescent Lights and Ballasts				
9. Land Clearing Debris (vegetation, stumpage, dirt)				
10. Metals				
11. Paint (through hazardous waste outlets)				
12. Wood				
13. Plastic Film (sheeting, shrink wrap, packaging)				
14. Window Glass				
15. Field Office Waste (office paper, aluminum cans, glass, plastic, and coffee cardboard)				
16. Other (insert description)				
17. Other (insert description)				
Total (In Weight)		(TOTAL OF ALL ABOVE VALUES – IN WEIGHT)		
		Percentage of Waste Diverted	(TOTAL WASTE DIVIDED BY TOTAL DIVERTED)	

END OF SECTION

SECTION 01 77 00

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. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

B. Related Sections include the following:

1. Division 01 Section 01 29 00 "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 01 Section 01 73 00 "Execution" for progress cleaning of Project site.
3. Division 01 Section 01 78 39 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.

6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
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.

B. Inspection: Submit a written request for inspection for Substantial Completion. 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: Reinspection will occur during final inspection.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. 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. **Inspections by the Architect, requested by the Contractor after the second punch list inspection, shall be at the cost of the Contractor. Costs shall be on a time and material basis and back charged to the Contractor’s contract with the Owner.**

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first 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.

1.6 WARRANTIES

A. Submittal Time: 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.

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 the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

1.7 CLOSEOUT DOCUMENT CHECKLIST

1. Form G704 Substantial Completion
2. Form G706 Affidavit of Payment of Debts and Claims
3. Form 706A Release of Liens Contractor / Subcontractor
4. Form 707 Consent of Surety Company
5. Final Payment App

6. Certificate of Occupancy
7. Environmental Certificates
8. Warranties (Letter of Guarantee and Warranty Info)
9. O&M Manuals
10. Hard Copy of As-Built Drawings
11. 2 sets of drawing discs. Update CAD files
12. Test & Balancing Reports
13. Field Reports / Inspection Reports
14. Pest Control Final Inspection Report & Warranty (Slabs over 400SF)
15. Record Shop Drawings and submittals
16. Affidavit of Discharge of State Tax Liability
17. Copy of completed final punch list signed off on by Owner's Rep
18. Punch list Closeout Letter

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: Provide 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 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 snow and ice to provide safe access to building.
    e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    f. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

DRAFT

AIA® Document G706™ – 1994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*
Summit Campus Middle & High School
1470 Aviator Way
Middletown, DE 19709

ARCHITECT'S PROJECT NUMBER:

CONTRACT FOR: General Construction
CONTRACT DATED:

OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
SURETY: ☐
OTHER: ☐

TO OWNER: *(Name and address)*
Appoquinimink School District
118 S. Sixth Street
Odessa, DE 19730

STATE OF:
COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707, Consent of Surety, may be used for this purpose

Indicate Attachment ☐ Yes ☒ No

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.

2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

3. Contractor's Affidavit of Release of Liens (AIA Document G706A).

CONTRACTOR: *(Name and address)*

BY: _____
(Signature of authorized representative)

_____
(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:

AIA Document G706™ – 1994. Copyright © 1970 and 1994 by The American Institute of Architects. **All rights reserved.** **WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This draft was produced by AIA software at 14:27:27 on 01/07/2011 under Order No.3527106222_1 which expires on 12/31/2011, and is not for resale.
User Notes: (1446003026)

DRAFT

AIA® Document G706A™ – 1994

Contractor's Affidavit of Release of Liens

PROJECT: *(Name and address)*
Summit Campus Middle & High School
1470 Aviator Way
Middletown, DE 19709

ARCHITECT'S PROJECT NUMBER:

CONTRACT FOR: General Construction

CONTRACT DATED:

OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
SURETY: ☐
OTHER: ☐

TO OWNER: *(Name and address)*
Appoquinimink School District
118 S. Sixth Street
Odessa, DE 19730

STATE OF:
COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.

2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR: *(Name and address)*

BY:

(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:

AIA Document G706A™ – 1994. Copyright © 1982 and 1994 by The American Institute of Architects. **All rights reserved.** **WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This draft was produced by AIA software at 14:28:01 on 01/07/2011 under Order No.3527106222_1 which expires on 12/31/2011, and is not for resale.
User Notes: (1462458164)

DRAFT

AIA® Document G707™ – 1994

Consent Of Surety to Final Payment

PROJECT: *(Name and address)*
Summit Campus Middle & High School
1470 Aviator Way
Middletown, DE 19709

ARCHITECT'S PROJECT NUMBER:

CONTRACT FOR: General Construction

CONTRACT DATED:

OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
SURETY: ☐
OTHER: ☐

TO OWNER: *(Name and address)*
Appoquinimink School District
118 S. Sixth Street
Odessa, DE 19730

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

, SURETY,

on bond of
(Insert name and address of Contractor)

, CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to
(Insert name and address of Owner)

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

(Surety)

(Signature of authorized representative)

Attest:
(Seal):

(Printed name and title)

AIA Document G707™ – 1994. Copyright © 1982 and 1994 by The American Institute of Architects. **All rights reserved.** **WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This draft was produced by AIA software at 14:28:35 on 01/07/2011 under Order No.3527106222_1 which expires on 12/31/2011, and is not for resale.
User Notes: (1850035023)

SECTION 01 78 39

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. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Sections include the following:

1. Division 01 Section 01 77 00 "Closeout Procedures" for general closeout procedures.
2. Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.3 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of Record Drawings as follows:

a. Initial Submittal: Submit **one** set(s) of **plots from corrected Record CAD Drawings** and **one** set(s) of marked-up Record Prints. Architect will initial and date each **plot** and mark whether general scope of changes, additional information recorded, and quality of drafting are acceptable. Architect will return **plots** and prints for organizing into sets, printing, binding, and final submittal.
b. Final Submittal: Submit **one** set(s) of marked-up Record Prints, **one** set(s) of Record Transparencies, Print each Drawing, whether or not changes and additional information were recorded.

1) Electronic Media: **CD-R GOLD Label**.

B. Record Specifications: Submit **one copy** of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit **one copy** of each Product Data submittal.

1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

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 prepare the 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 understandable drawing technique.
c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

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. Changes made by Change Order or Change Directive.
f. Changes made following Architect's written orders.
g. Details not on the original Contract Drawings.
h. Field records for variable and concealed conditions.
i. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Transparencies: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings.

1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
2. Refer instances of uncertainty to Architect for resolution.
3. Owner will furnish Contractor one set of transparencies of the Contract Drawings for use in recording information.
4. Print the Contract Drawings and Shop Drawings for use as Record Transparencies. Architect will make the Contract Drawings available to Contractor's print shop.

C. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:

1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
2. Format: **DWG**, Version AutoCAD, operating in **Microsoft Windows** operating system.
3. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
4. Refer instances of uncertainty to Architect for resolution.
5. Architect will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.

    a. Architect makes no representations as to the accuracy or completeness of CAD Drawings as they relate to the Contract Drawings.
    b. CAD Software Program: The Contract Drawings are available in AutoCAD 2010.

D. 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.

E. 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.
2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.

3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
4. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect **and Construction Manager**.
    e. Name of Contractor.

2.2 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.

2.3 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.

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 modifications to Project Record Documents as they occur; do not wait until the 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

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. Demolition and removal of selected site elements.
3. 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. Engineering Survey: Submit engineering survey of condition of building.

B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property**, for dust control and for noise control**]. Indicate proposed locations and construction of barriers.

C. Schedule of selective demolition activities with starting and ending dates for each activity.

D. Predemolition photographs or video.

E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.5 CLOSEOUT SUBMITTALS

A. Inventory of items that have been removed and salvaged.

1.6 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.7 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.

1. Before selective demolition, Owner will remove the following items:

a. Furniture, Fixtures and equipment not to be demolished or disposed of.

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.

1. Maintain fire-protection facilities in service during selective demolition operations.

G. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.8 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 ANSI/ASSP 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 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 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.

3.4 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.

3.5 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 <**Insert number**> 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. **Comply with requirements in Section 017419 "Construction Waste Management and Disposal."**

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area **designated by Owner**.
5. Protect items from damage during transport and storage.

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 reinstalled in their original locations after selective demolition operations are complete.

3.6 CLEANING

A. Remove demolition waste materials from Project site **and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."**

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

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

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

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 cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Slabs-on-grade.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork. Formwork submittal for elevated slabs and columns shall be signed and sealed by a professional engineer licensed in Pennsylvania.

1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.

E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Architect and Engineer.

F. Samples: For waterstops and vapor retarder.

G. Welding certificates.

H. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Fiber reinforcement.
6. Waterstops.
7. Curing compounds.
8. Floor and slab treatments.
9. Bonding agents.
10. Adhesives.
11. Vapor retarders.
12. Semirigid joint filler.
13. Joint-filler strips.
14. Repair materials.

I. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates.

J. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

K. Field quality-control reports.

L. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

G. Preinstallation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete subcontractor.
e. Special concrete finish subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

a. High-density overlay, Class 1 or better.
b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
c. Structural 1, B-B or better; mill oiled and edge sealed.
d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Forms for Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I, gray or white. Supplement with the following:

a. Fly Ash: ASTM C 618, Class F or C.
b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Silica Fume: ASTM C 1240, amorphous silica.

C. Normal-Weight Aggregates: ASTM C 33, Class 3S, coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 1 inch for foundation concrete, 3/4 inch for elevated slabs.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

C. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Davis Colors.
b. Scofield, L. M. Company.
c. Solomon Colors, Inc.

2. Color: As selected by Architect from manufacturer's full range.
3. Location: As indicated

2.6 WATERSTOPS

A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch.

1. Product: ADCOR ES by W.R. Grace.

2.7 VAPOR RETARDERS

A. Plastic Vapor Retarder: ASTM E 1745, Class B. Include manufacturer's recommended adhesive or pressure-sensitive tape. Minimum 15 mils nominal thickness.

1. Products:

a. Raven Industries Inc.; Vapor Block 15.
b. Stego Industries, LLC; Stego Wrap, 15 mils.

2.8 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Conspec by Dayton Superior; Aquafilm.
b. Dayton Superior Corporation; Sure Film (J-74).
c. Euclid Chemical Company (The), an RPM company; Eucobar.
d. L&M Construction Chemicals, Inc.; E-CON.
e. Meadows, W. R., Inc.; EVAPRE.
f. Sika Corporation; SikaFilm.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, nondissipating.

1. Products:

a. Dayton Superior Corporation; Safe Cure and Seal (J-19).
b. Euclid Chemical Company (The); Diamond Clear VOX.
c. L&M Construction Chemicals, Inc.; Dress & Seal WB.
d. Meadows, W. R., Inc.; Vocomp-20.
e. Sonneborn, Div. of ChemRex; Kure-N-Seal.

F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. Products:

a. Euclid Chemical Company (The); Super Diamond Clear VOX.
b. L&M Construction Chemicals, Inc.; Lumiseal WB Plus.
c. Meadows, W. R., Inc.; Vocomp-30.

2. Application: Apartments concrete slabs.

2.9 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Types I and II, non-load bearing and Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.10 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

2.11 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.
2. Combined Fly Ash and Pozzolan: 25 percent.
3. Ground Granulated Blast-Furnace Slag: 25 percent.
4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
5. Silica Fume: 10 percent.
6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.12 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: As Indicated.

2. Maximum Water-Cementitious Materials Ratio: 0.50.
3. Slump Limit: 4 to 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
4. Air Content: 5 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.

B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: As Indicated.
2. Minimum Cementitious Materials Content: As indicated
3. Slump Limit: 4 inches, plus or minus 1 inch.
4. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
5. Synthetic Micro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.5 lb/cu. yd.

2.13 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.14 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch for smooth-formed finished surfaces.
2. Class B, 1/4 inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50

deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete pour.
2. Vapor Barrier shall extend down foundation wall to top of footing.
3. Lap vapor barrier down face of footing wall to top of concrete footing. Seal vapor barrier to footing with manufacturer’s mastic.
4. Overlap joints 6 inches and seal with manufacturer’s tape.
5. Seal all penetrations (including pipes) per manufacturer’s instructions with manufacturer’s Tape and Mastic.
6. No penetration of the vapor barrier is allowed except for reinforcing steel and permanent utilities.
7. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6 inches and taping all four sides with tape.
8. Vapor Barrier installation shall be observed by the Owner’s rep prior to placement of the concrete.
9. Seal the different types of vapor retarders together by over lapping 6 inches and taping the intersection of the two vapor barriers.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect and Engineer.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
6. Where indicated, use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Shrinkage Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints (Exposed Joints): Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 WATERSTOPS

A. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.8 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.9 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view,

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete surfaces exposed to public view:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent

formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces to receive trowel finish.

C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:

    a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15, for slabs-on-grade.
    b. Specified overall value of flatness, F(F) 30; with minimum local value of flatness, F(F) 24; for suspended slabs.

D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

E. Broom Finish: Apply a broom finish to exposed exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-

place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.12 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

    a. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

    a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer, unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.13 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least six month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect and Engineer’s approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a special inspector to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Steel reinforcement size, spacing, placement, support, cover and laps.
2. Dowel size, spacing, placement, support and embedment.
3. Bolts, studs, and other embedments, and size, location and embedment depth.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.
8. Inspection reports shall be submitted to the Owner, Architect, Engineer and Contractor within 48 hours of inspection.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M.

    a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
9. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

END OF SECTION 03 30 00

SECTION 040120.63 - BRICK MASONRY REPAIR

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes repairing brick masonry.

1.2 UNIT PRICES

A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."

1.3 DEFINITIONS

A. Rebuilding (Setting) Mortar: Mortar used to set and anchor masonry in a structure, distinct from pointing mortar installed after masonry is set in place.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Include plans, elevations, sections, and locations of replacement bricks on the structure.
2. Show provisions for expansion joints or other sealant joints.

C. Samples: For each exposed product and for each color and texture specified.

1.6 INFORMATIONAL SUBMITTALS

A. Quality-control program.

1.7 QUALITY ASSURANCE

A. Brick Masonry Repair Specialist Qualifications: Engage an experienced brick masonry repair firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing masonry is insufficient experience for masonry repair work.

B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage.

C. Mockups: Prepare mockups of brick masonry repair to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and installation.

1. Masonry Repair: Prepare sample areas for each type of masonry repair work performed. If not otherwise indicated, size each mockup not smaller than two adjacent whole units or approximately 48 inches (1200 mm) in least dimension. Construct sample areas in locations in existing walls where directed by Architect unless otherwise indicated. Demonstrate quality of materials, workmanship, and blending with existing work.

PART 2 - PRODUCTS

2.1 MASONRY MATERIALS

A. Face Brick: As required to complete brick masonry repair work.

1. Brick Matching Existing: Units with colors, color variation within units, surface texture, size, and shape that match existing brickwork.

a. For existing brickwork that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range and variation rather than brick that matches an individual color within that range.

2. Special Shapes:

a. Provide molded, 100 percent solid shapes for applications where core holes or "frogs" could be exposed to view or weather when in final position and where shapes produced by sawing would result in sawed surfaces being exposed to view.
b. Provide specially ground units, shaped to match patterns, for arches and where indicated.
c. Mechanical chopping or breaking brick, or bonding pieces of brick together by adhesive, are unacceptable procedures for fabricating special shapes.

2.2 MORTAR MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or Type II, except Type III may be used for cold-weather construction; white **or gray, or both** where required for color matching of mortar.

B. Hydrated Lime: ASTM C207, Type S.

C. Masonry Cement: ASTM C91/C91M.

D. Mortar Cement: ASTM C1329/C1329M.

E. Mortar Sand: ASTM C144.

1. Exposed Mortar: Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
2. Colored Mortar: Natural sand or ground marble, granite, or other sound stone of color necessary to produce required mortar color.

F. Water: Potable.

2.3 MANUFACTURED REPAIR MATERIALS

A. Brick Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching brick masonry.
1. Use formulation that is vapor and water permeable (equal to or more than the brick), exhibits low shrinkage, has lower modulus of elasticity than bricks being repaired, and develops high bond strength to all types of masonry.
2. Formulate patching compound in colors and textures to match each brick being patched.

2.4 ACCESSORY MATERIALS

A. Setting Buttons and Shims: Resilient plastic, nonstaining to masonry, sized to suit joint thicknesses and bed depths of bricks, less the required depth of pointing materials unless removed before pointing.

B. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:

1. Previous effectiveness in performing the work involved.
2. Minimal possibility of damaging exposed surfaces.
3. Consistency of each application.
4. Uniformity of the resulting overall appearance.
5. Do not use products or tools that could leave residue on surfaces.

2.5 MORTAR MIXES

A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

B. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.

C. Do not use admixtures in mortar unless otherwise indicated.

PART 3 - EXECUTION

3.1 BRICK REMOVAL AND REPLACEMENT

A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated **or are to be reused**. Carefully remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.

B. Support and protect remaining masonry that surrounds removal area.

C. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

D. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

E. Remove in an undamaged condition as many whole bricks as possible.

1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.

F. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for brick replacement.

G. Replace removed damaged brick with other removed brick in good condition, where possible, matching existing brick. Do not use broken units unless they can be cut to usable size.

H. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

1. Maintain joint width for replacement units to match existing joints.

I. Lay replacement brick with rebuilding (setting) mortar and with completely filled bed, head, and collar joints. Butter ends with enough mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. (30 g/194 sq. cm per min.) Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.

1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.

J. Curing: Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.

3.2 BRICK MASONRY PATCHING

A. Patching Bricks:

1. Remove loose material from masonry surface. Carefully remove additional material so patch does not have feathered edges but has square or slightly undercut edges on area to be patched and is at least 1/4 inch (6 mm) thick, but not less than recommended in writing by patching compound manufacturer.
2. Mask adjacent mortar joint or rake out for repointing if patch extends to edge of brick.
3. Rinse surface to be patched and leave damp, but without standing water.
4. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
5. Place patching compound in layers as recommended in writing by patching compound manufacturer, but not less than 1/4 inch (6 mm) or more than 2 inches (50 mm) thick. Roughen surface of each layer to provide a key for next layer.
6. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of brick. Shape and finish surface before or after curing, as determined by testing, to best match existing brick.
7. Keep each layer damp for 72 hours or until patching compound has set.

3.3 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, applied by low pressure spray.

1. Do not use metal scrapers or brushes.
2. Do not use acidic or alkaline cleaners.

END OF SECTION 040120.63

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 06 10 00

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. Framing with dimension lumber.
2. Blocking for rooftop equipment bases and support curbs.
3. Wood blocking and nailers.
4. Wood sleepers.
5. Plywood backing panels.

B. Related Requirements:

1. Section 06 16 00 "Sheathing."

1.3 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NLGA: National Lumber Grades Authority.
3. RIS: Redwood Inspection Service.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.4 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 data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Power-driven fasteners.
3. Powder-actuated fasteners.
4. Expansion anchors.
5. Metal framing anchors.

1.6 QUALITY ASSURANCE

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

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: 15 percent unless otherwise indicated.

2.2 FIRE-RETARDANT-TREATED MATERIALS

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

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

1. Use treatment that does not promote corrosion of metal fasteners.
2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
3. Design Value Adjustment Factors: Treated lumber shall be tested according ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841. For enclosed roof framing, framing in attic spaces, and where high temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

E. Application: Treat items indicated on Drawings, and the following:

1. Concealed blocking.
2. Plywood backing panels.

2.3 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA 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, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that 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 items indicated on Drawings, and the following:

1. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.
2. Wood floor plates that are installed over concrete slabs-on-grade.

2.4 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 items of dimension lumber size, provide Construction or No. 2 grade lumber and the following species:

1. Hem-fir (north); NLGA.
2. Mixed southern pine; SPIB.
3. Spruce-pine-fir; NLGA.

C. For concealed boards, provide lumber with 15 percent maximum moisture content and the following species and grades:

1. Mixed southern pine; No. 2 grade; SPIB.
2. Hem-fir or hem-fir (north); Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or spruce-pine-fir; Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.

D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.5 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

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.

F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 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 six times the load imposed when installed in unit masonry assemblies and equal to four 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.

2.7 METAL FRAMING ANCHORS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Cleveland Steel Specialty Co.

2. KC Metals Products, Inc.
3. Phoenix Metal Products, Inc.
4. Simpson Strong-Tie Co., Inc.
5. USP Structural Connectors.

B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer that meet or exceed those of basis-of-design products. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

1. Use for interior locations unless otherwise indicated.

D. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.

1. Use for wood-preservative-treated lumber and where indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough 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. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.

D. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

E. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.

F. Do not splice structural members between supports unless otherwise indicated.

G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

H. 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.

I. Comply with AWPA 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.

J. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- thickness.
3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.

K. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

L. 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 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

D. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 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 rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 10 00

SECTION 07 92 00

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. Silicone joint sealants for exterior use.
2. Urethane joint sealants for interior use.
3. Latex joint sealants.

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-wide joints formed between two 6-inch-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. Qualification Data: For qualified Installer and testing agency.

B. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.

A. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

D. Field-Adhesion Test Reports: For each sealant application tested.

E. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 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.
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.

1.8 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which 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 warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.

2. Disintegration of joint substrates from natural 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 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. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 NONSTAINING SILICONE JOINT SEALANTS – General Exterior

A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.

B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Dow Corning Corporation.
b. GE Construction Sealants; Momentive Performance Materials Inc.
c. Pecora Corporation.
d. Sika Corporation; Joint Sealants.
e. Tremco Incorporated.

2.3 URETHANE JOINT SEALANTS – General Interior

A. Urethane, Immersible, S, NS, 25, T, NT, I: Immersible, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, traffic-and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Uses T, NT, and I.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. BASF Corp. -Construction Chemicals.
b. Pecora Corporation.
c. Tremco Incorporated.

2.4 LATEX JOINT SEALANTS – General Interior

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Pecora Corporation.

b. Sherwin-Williams Company (The).
c. Tremco Incorporated.

2.5 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.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Adfast.
b. Alcot Plastics Ltd.
c. BASF Corp. -Construction Chemicals.
d. Construction Foam Products; a division of Nomaco, Inc.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), Type O (open-cell material), Type B (bicellular material with a surface skin), or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, 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.

2.6 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.
   c. Unglazed surfaces of ceramic tile.

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. Glass.
   c. Glazed surfaces of ceramic tile.

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.

B. 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.

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 of joint length for each kind of sealant and joint substrate.

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 passes 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 fill, 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 and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Work under this section comprises of furnishing hollow metal doors and frames, including transom frames, sidelight and window frames with provision for glazed, paneled or louvered openings, fire labeled and non-labeled, as scheduled.

1. Flush Steel Doors.
2. Steel frames.
3. Hollow Metal Framing Systems.

1.2 RELATED SECTIONS

A. Related documents, drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 specification sections apply to this section. The latest published edition of each reference applies.

1. Section 061000 - Rough Carpentry
2. Section 081400 - Wood Doors
3. Section 087100 - Door Hardware
4. Section 088000 - Glazing
5. Section 099000 - Painting and Coating
6. Section 260519 – Low Voltage Electrical Power Conductors and Cables
7. Section 281000 – Access Control

1.3 REFERENCES

A. The intent of this document is that all hollow metal ant its application will comply or exceed the standards identified below. The latest published edition of each reference applies.

1. NFPA- National Fire Protection Association

a. NFPA 80 - Standard for Fire Doors and Other Opening Protectives
b. NFPA-101 – Life Safety Code
c. NFPA 105 – Standard Smoke Door Assemblies and Other Opening Protectives
d. NFPA 252 - Standard Method of Fire Tests of Door Assemblies.

2. DHI- Door and Hardware Industry

a. DHI A 115.IG - Installation Guide for Doors and Hardware.

3. ANSI/BHMA A 156.115 - Hardware Preparations in Standard Steel Doors and Frames.
4. ANSI/BHMA A156.7 - Hinge Template Dimensions.
5. ANSI- American National Standards Institute

a. ANSI A250.3 Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames
b. ANSI A 250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel

Doors, Frames, and Frame Anchors
c. ANSI A250.6-2003 Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames
d. ANSI A 250.8 - SDI-100 Specifications for Standard Steel Doors and Frames
e. ANSI A 250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames
f. ANSI A 250.11 - Recommended Erection Instructions for Steel Frames
g. ANSI A 250.13 Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies for Protection of Building Envelopes

6. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies
7. ASTM A568-2011 *Standard Specification for Steel Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for*
8. ASTM E 152 - Standard Methods of Fire Tests of Door Assemblies
9. SDI - Steel Door Institute

a. SDI-105 – Recommended Erection Instructions for Steel Frames
b. SDI-107 – Hardware on Steel Doors (Reinforcement - Application)
c. SDI-111 - Recommended Details for Standard Steel Doors, Frames, Accessories, and Related Components
d. SDI-117 - Manufacturing Tolerances Standard Steel Doors and Frames
e. SDI-118 – Basic Fire Door Requirements

10. ANSI-ICC A117.1 – Accessible and Usable Building and Facilities.
11. Federal Emergency Management Agency (FEMA) 361 Guidelines, ICC500-2014
12. UL - Building Materials Directory; Underwriters Laboratories Inc.
13. WH - Certification Listings; Warnock Hersey International Inc.

1.4 SUBMITTALS

A. Submit to comply with provisions of Section 013300 Submittal Procedures.

B. Product Data: Manufacturer's standard details and catalog data indicating compliance with referenced standards, and manufacturer's installation instructions.

C. Shop Drawings: Provide a schedule of doors and frames using same reference numbers for details and door openings as those on the contract documents. Shop drawings should include the following information Indicate frame configuration, anchor types and spacing, location of cutouts for hardware, reinforcement, to ensure doors and frames are properly prepared and coordinated to receive hardware.

1. Elevations of each door type.
2. Details for door core
3. Details of doors, including vertical- and horizontal-edge details and metal thicknesses. Locations of cutouts for glass and louvers.
4. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
5. Mounting locations for hardware
6. Thickness of reinforcement/preparations for hardware
7. Details of anchorages, joints, field splices, and connections.
8. Details of accessories.
9. Details of moldings, removable stops, and glazing.
10. Fire ratings
11. Finish

D. Closeout Submittals to comply with Section 017800 Closeout Submittals procedures; furnish copies of manufacturer's warranty information and maintenance instructions.

1.5 QUALITY ASSURANCE

A. Select a qualified hollow metal distributor, who is a direct account of the manufacturer of the products furnished. In addition, that distributor must have in their regular employment an Architectural Hardware Consultant (AHC), Certified Door Consultant (CDC), Architectural Openings Consultant (AOC), or an Door & Hardware Specification Consultant (DHSC) or equivalent door and hardware industry experience who will be available to consult with the Architect and Contractor regarding any matters affecting the door and frame opening.

B. Manufacturer Qualifications: Certified Member of the Steel Door Institute in good standing.

C. Installer: Minimum five years documented experience installing products specified this Section.

D. Certificates:

1. Manufacturer's certification that products comply with referenced standards.
2. All Hollow Metal must be provided by an SDI Certified Manufacture.

E. Fire Rated Doors and Frames: Underwriters' Laboratories, Warnock Hersey, and Factory Mutual labeled fire doors and frames:

1. Label fire doors and frames in accordance with Underwriters Laboratories standard UL10C Positive Pressure Fire Tests of Door Assemblies.
2. Construct and install doors and frames to comply with current issue of NFPA 80.
3. Manufacture Underwriters' Laboratories labeled doors and frames under the UL Follow Up Service (FUS) and in strict compliance to UL procedures, and provide the degree of fire protection, heat transmission and panic loading capability indicated by the opening class.
4. Manufacture Intertek Testing Services / Warnock Hersey labeled doors and frames under the ITS/WH factory inspection program and in strict compliance to ITS/WH procedures, and provide the degree of fire protection capability indicated by the opening class.
5. Affix a physical label or approved marking to each fire door or fire door frame, at an authorized facility as evidence of compliance with procedures of the labeling agency.
6. Conform to applicable codes for fire ratings. It is the intent of this specification that hardware and its application comply or exceed the standards for labeled openings. In case of conflict between types required for fire protection, furnish type required by NFPA and UL.
7. Project requires door assemblies and components that are compliant with positive pressure and S-label requirements. Specifications must be cross-referenced and coordinated with hardware and other door manufacturers to ensure that total opening engineering is compatible with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping

1. Do not use non-vented plastic or canvas shelters to prevent rust or damage.
2. Should wrappers become wet, remove immediately

B. Delivery and Site Acceptance

1. The supplier shall deliver all materials to the project site; direct factory shipments are not allowed

unless agreed upon beforehand. Supplier shall coordinate delivery times and schedules with the contractor.

2. Deliver doors cardboard wrapped or crated to provide protection during transit and job site storage. Provide additional protection to prevent damage to any factory-finished doors. Mark all doors and frames with architects opening numbers as shown on the contract documents and shop drawings on the center hinge preparation location.
3. Upon delivery, check in doors and frames jointly with supplier. Inspect doors and frames upon delivery for damage, correct quantities or shortages. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to the architect. Otherwise, remove and replace damaged goods as directed. Note shortages and replace immediately.

C. Storage and Protection

1. Handle, store and protect products in accordance with the manufacturers printed instructions and ANSI/SDI A250.8, A250.10, and NAAMM/HMMA 840.
2. Store doors vertically in a dry area, under a proper vented cover. Protect doors from adverse weather elements.
3. Store frames in an upright position with heads uppermost under cover. Place on 4 inch (102 mm) high wood sills to prevent rust and damage. Store assembled frames five units maximum in a stack with 2-inch (51 mm) space between frames to promote air circulation.

1.7 COORDINATION

A. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal cutouts and reinforcement for door hardware, electric devices and recessed items.

B. Coordinate Work with frame opening construction, door and hardware installation.

C. Sequence installation to accommodate required door hardware.

D. Verify field dimensions for factory assembled frames prior to fabrication.

1.8 WARRANTY

A. Comply with Section 017800 Closeout Submittals

B. All doors and frames shall be warranted in writing by the manufacturer against defects in materials and workmanship for a period of one (1) year commencing on the date of manufacture.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design - MESKER a dormakaba Brand, Toll Free Tel: 844-463-7537
Email: specifications@dormakaba.com
Web: http://meskerdoor.com

B. Acceptable Manufacturer - Curries an ASSA Abloy Company, Tel: 641-423-1334
Email: curries@curries.com
Web: www.curries.com

C. Acceptable Manufacturer - Steelcraft an Allegion Company, Toll Free Tel: 877-671-7011
Web: https://us.allegion.com/en/home/products/brands/steelcraft.html

D. Substitutions: As approved by Architect.

E. All substitution requests must be submitted within the procedures and time frame as outlined in Division 1, General Requirements. Approval of products is at the discretion of the architect and his consultant

F. Provide all steel doors and frames from a single SDI certified manufacturer.

2.2 DOORS

A. General: Construct exterior/interior doors to the following designs and gages:

1. Exterior Doors: Zinc-Iron Alloy-Coated galvannealed steel, ASTM A 653, A40 minimum:

a. Thickness:

1) 14 gage

b. Close tops of exterior swing-out doors to eliminate moisture penetration. Galvannealed steel top caps are permitted.

2. Interior Doors: Cold-rolled steel, ASTM A 1008/A 1008M:

a. Thickness:

1) 18 gage

3. Interior Doors: Zinc-Iron Alloy-Coated galvannealed steel, ASTM A 653, A40 minimum at all areas where moisture is a concern:

a. Thickness:

1) 18 gage

4. Prime Finish Doors: Clean, phosphatize and factory prime painted doors indicated on Door Schedule as HM.
5. Glass moldings and stops:

a. Fabricate from 20 gage minimum steel:
b. Install trim into the door as a four-sided welded assembly with mitered, reinforced and welded corners.
c. Trim: identical on both sides of the door.
d. Labeled and non-labeled doors: use the same trim.
e. Channeling requirements:

1) Cutouts larger than 36” in height require 18 gage perimeter channelings in the cutout of the door prior to installation of the lite kit our louver.

6. Hardware Reinforcements:

a. Hinge reinforcements for full mortise hinges: minimum 7 gage.
b. Lock renforcements : minimum 16 gage.
c. Closer reinforcements: minimum 14 gage steel.

d. Projection welded hinge and lock reinforcements to the edge of the door.
e. Provided adequate reinforcements for other hardware as required.

B. Full Flush Doors:

1. Basis of Design: Mesker N Series.

a. Performance:

1) Physical performance: 1 million cycles per ANSI A250.4.
2) Thermal performance (gasketed).

a) Polystyrene core.

2. Door Thickness: 1-3/4 inches.
3. Door faces reinforced and sound deadened as follows:

a. Polystyrene Core: Full 1-3/4 inches thick rigid polystyrene, adhered to inside of door faces and polystyrene core with waterproof adhesive for bond strength and rust prevention.

4. Vertical edge seams: Provide doors with continuous vertical mechanical inter-locking joints at lock and hinge edges. Finish edges as follows:

a. Welded Vertical Edges (NVS): Continuous vertical weld and pressed smooth with no putty or filler.

5. Bevel hinge and lock door edges 1/8 inch (3 mm) in 2 inches (50 mm). Square edges on hinge and/or lock stiles are not acceptable.
6. Reinforce top and bottom of doors with galvannealed 16 gage minimum, welded to both panels.
7. Fire Rating: Supply door units bearing Labels for fire ratings indicated in Door Schedule for the locations indicated.

2.3 DOOR FRAMES

A. General: Construct exterior/interior metal door frames to the following designs and gages;

1. Exterior Frames: Zinc-Iron Alloy-Coated galvannealed steel, ASTM A 653, A40 minimum:

a. Thickness:

1) 14 gage.

2. Interior Frames in Masonry: Zinc-Iron Alloy-Coated galvannealed steel, ASTM A 653, A40 minimum, galvannealed steel.

a. Thickness:

1) 16 gage.

3. Interior Frames in stud wall construction: cold rolled steel, ASTM A 1008/A 1008M.

a. Thickness:

1) 16 gage.

4. Electrical Requirements: Coordinate all electrical requirements for doors and frames. Make provisions for installation of electrical items so that wiring can be readily removed and replaced.

a. Provide cutouts and reinforcements required for metal door frame to accept electric components.
b. Frame with Electrical Hinges: Junction box welded over center hinge reinforcing. Top or bottom hinge locations are not permitted.
c. Provide cutouts and reinforcements required to accept security system components.
d. Coordinate with Section 087100 for electrified hardware items.

A. Flush Steel Frames:

1. Basis of Design: Mesker F-Series.

a. Performance:

1) Physical performance: 1 million cycles per ANSI A250.4

2. Construction:

a. Three-piece knock-down frames; mitered joints, with locking tab at each head and jamb intersection for 16 and 14 gage.

3. Construction: Factory-welded three-sided frames.

a. Full profile welded:

1) Weld miter joints between head and jamb faces completely along their length either internally or externally.
2) Internally weld perimeter profile joints full length of soffit and rabbets with hairline seams on external meeting surfaces. Grind and finish face joints smooth.

4. Profile:

a. Face:

1) 2 Inches face dimension and types and throat dimensions indicated on the Door Schedule.

b. Stops:

1) Standard 5/8-inch-high stops
2) thermal break. A kerf slot for gasketing to be built into the thermal break.

5. Provide following reinforcement and accessories:

a. Preparation for 4-1/2 inches high, standard weight, or heavy weight, full mortise hinges; with plaster guard. Minimum 7-gauge steel.
b. Hinge Preparation for 5-inch-high, universal standard weight, or heavy weight, full mortise hinges; with plaster guard. Minimum 7-gauge steel.

c. Preparation for continuous hinge reinforcement. Minimum 14-gauge steel.
d. Strike preparation (single doors) for 4-7/8-inch universal strike; with plaster guard. Minimum 16-gauge steel.
e. Closer preparation minimum 14-gauge steel.
f. Silencers. Prepare frames to receive inserted type door silencers, 3 per strike jamb on single doors. Stick-on silencers are permitted on paired openings.

6. Fire Rating: Supply frame units bearing Labels for fire ratings indicated in Door Schedule for the locations indicated.
7. Finish: Factory prime finish in accordance with ANSI A 250.10.
8. Basis of Design: Mesker F-Series for rated elevations.

a. Performance:

1) Physical performance: 1 million cycles per ANSI A250.4

9. Construction:
10. Profile: To match specifications needed for FEMA 361 tested assembly
11. Provide following reinforcement and accessories: To match specifications needed for FEMA 361 tested assembly
12. Fire Rating: Supply frame units bearing Labels for fire ratings indicated in Door Schedule for the locations indicated.
13. Finish: Factory prime finish.
14. Accessories:

3.2 ACCESSORIES

A. Anchors: Manufacturer's standard framing anchors, specified in manufacturer's printed installation instructions for project conditions.

B. Astragals for pairs of doors: Manufacturer's standard for labeled and non-labeled openings.

C. Plaster Guards: Same material as door frame, minimum 24 gage (0.5 mm) minimum; provide for all strike boxes. Plaster guards not mandatory on interior after set frames.

D. Silencers: Resilient rubber, Inserted type, three per strike jamb for single openings. Stick-on silencers shall not be permitted except on hollow metal framing systems.

E. Glazing: Specified in Section 088000.

3.3 FABRICATION

A. Steel Frames:
1. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.

a. Clearances shall comply with the requirements of NFPA 80 Chapter 5.

2. Factory-welded frames: Head and jamb intersecting corners mitered at 45 degrees, with back welded

joints ground smooth.

a. Continuous face weld the joint between the head and jamb faces along their length either internally or externally. Grind, prime paint, and finish smooth face joints with no visible face seams.

3. Provide temporary steel spreaders (welded to the jambs at each rabbet of door openings) on welded frames during shipment. Remove temporary steel spreaders prior to installation of the frame.

B. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

C. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.

D. Unless otherwise indicated, provide exposed fasteners with countersunk flat or oval heads for exposed screws and bolts.

E. Prepare doors and frames to receive mortised and concealed hardware per final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of SDI-107 and ANSI-A115 Series specifications for door and frame preparation for hardware.

F. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site. Provide internal reinforcements for all doors to receive door closers and exit devices where scheduled.

G. Locate hardware as indicated on Shop Drawings or, if not indicated, per the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

H. Exposed door and frame surfaces to be cleaned and treated then coated with rust inhibitive primer. Water-based primer and color paint finishes to be free of Hazardous Air Pollutants (HAPS) and Volatile Organic Compounds (VOVS). Paint to comply with ANSI A250.3 and A250.10.

3.4 FINISHES

A. Chemical Treatment: Treat steel surfaces to promote paint adhesion.

B. Factory Prime Finish: Meet requirements of ANSI A 250.10.

PART 4 EXECUTION

4.1 EXAMINATION

A. Verify that project conditions are acceptable before beginning installation of frames.

1. Verify that completed openings to receive knock-down wrap-around frames are of correct size and thickness.
2. Verify that completed concrete or masonry openings to receive butt type frames are of correct size.

B. Do not begin installation until conditions have been properly prepared.

C. Correct unacceptable conditions before proceeding with installation.

4.2 INSTALLATION

A. Install doors and frames in accordance with manufacturer's printed installation instructions and with Steel

Door Institute's recommended erection instructions for steel frames SDI A250.11 and NAAMM/HMMA 840.

B. Fire Doors and Frames: Install in accordance with ANSI A 250.11 and NFPA 80.

1. To ensure compliance with Positive Pressure criteria as required by UBC7-2, UL10C, NFPA5000 and all applicable Local, State and National Code Jurisdictions, all Doors and Frames should be checked for accurate installation per Manufacturers installation instructions to provide proper fire and Smoke Gasketing as tested and listed.
2. Fit hollow-metal doors accurately in frames, within clearances specified in ANSI A 250.11 and SDI 100. Install fire rated doors with clearances specified in NFPA 80.

C. Comply with provisions of SDI-105, “Recommended Erection Instructions for Steel Door Frames,” unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set.

1. Except for frames located in existing concrete, masonry, or gypsum board assembly construction, place frames before constructing enclosing walls and ceilings.
2. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors. Use additional anchors as required for height per manufacturers’ installation instructions.
3. At existing concrete or masonry construction, install at least 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices. Use additional anchors as required for height per manufacturers’ installation instructions.
4. In metal-stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In steel-stud partitions, attach wall anchors to studs with screws. Secure Sill Anchors to floor. Use additional anchors as required for height per manufacturers’ installation instructions.
5. Drywall series frames are designed for installation in interior applications after construction of wood or metal stud and drywall applications. Drywall series frames are provided with adjustable jamb lock anchors for secure installation. Install frames per manufacturers’ installation instructions. Adjust anchors and secure sill and baseboard anchors as provided.

D. Remove temporary steel spreaders prior to installation of frames.

E. Set frames accurately in position; plumb, align and brace until permanent anchors are set. After wall construction is complete, remove temporary wood spreaders.

1. Field splice only at approved locations indicated on the shop drawings.
2. Weld, grind, and finish as required to conceal evidence of splicing on exposed faces.

F. Apply hardware in accordance with hardware manufacturers' instructions and Section 087100 of these Specifications. Install hardware with only factory-provided fasteners. Install silencers. Adjust door installation to provide 1/8” at head and 1/8” at strike and hinge jamb with door undercut to meet fire ratings and floor conditions to achieve maximum operational effectiveness and appearance.

4.3 FIELD QUALITY CONTROL

A. Fire-Rated Door Assembly Testing:

1. Upon completion of the installation, test each fire door assembly to confirm proper operation of its

closing device and verify that it meets all criteria of a fire door assembly per NFPA 80.

2. Perform inspections by individuals with documented knowledge and understanding of the operation components of the type of door being tested.
3. Provide a written record to the Owner with copies available to the Authorities Having Jurisdiction (AHJ).
4. Record shall list the fire door assembly and include the door number with an itemized list of hardware set components for each door opening and location in the facility.

4.4 ADJUST AND CLEAN

A. Adjust doors for proper operation, free from binding or other defects.

B. Clean and restore soiled surfaces. Remove scraps and debris and leave site in a clean condition.

C. Prime Coat Touch-Up: Immediately after erection, sand smooth rusted or damaged areas of prime coat, and apply touch-up of compatible air-drying primer.

D. Properly clean and apply paint to doors and frames in accordance with HMMA-840 TN01 and ANSI A250.8 appendix B along with Manufactures recommended surface preparation for painting.

4.5 PROTECTION

A. Protect installed products and finished surfaces from damage during construction.

END OF SECTION 081113

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Five-ply flush wood veneer-faced doors and transom panels for transparent finish.
2. Factory finishing flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Requirements:

1. Section 064216 "Flush Wood Paneling" for requirements for veneers from the same flitches for both flush wood doors and flush wood paneling.
2. Section 087100 "Door Hardware" and 087100.01 “Door Hardware Sets” for door hardware.
3. Section 088000 "Glazing" for glass view panels in flush wood doors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product, including the following:

1. Door core materials and construction.
2. Door edge construction
3. Door face type and characteristics.
4. Door louvers.
5. Door trim for openings.
6. Door frame construction.
7. Factory-machining criteria.
8. Factory- finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:

1. Door schedule indicating door and frame location, type, size, fire protection rating, and swing.
2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
3. Details of frame for each frame type, including dimensions and profile.
4. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
5. Dimensions and locations of blocking for hardware attachment.

6. Dimensions and locations of mortises and holes for hardware.
7. Clearances and undercuts.
8. Requirements for veneer matching.
9. Doors to be factory finished and application requirements.
10. Apply AWI Quality Certification Program label to Shop Drawings.

C. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.
2. Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Special warranties.

B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

C. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.6 QUALITY ASSURANCE

A. Manufacturer's Certification: Licensed participant in AWI's Quality Certification Program.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in cardboard cartons, and wrap bundles of doors in plastic sheeting.

C. Mark each door on bottom rail with opening number used on Shop Drawings.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of construction period.

B. Environmental Limitations: Do not deliver or install doors until building is enclosed and weathertight, 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 remainder of construction period.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Delamination of veneer.
   b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
   c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Wood Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings and temperature-rise limits indicated on Drawings, based on testing at positive pressure in accordance with UL 10C or NFPA 252.

1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.

B. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing in accordance with UL 1784 and installed in compliance with NFPA 105.

2.3 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with AWI/AWMAC/WI's "Architectural Woodwork Standards."

1. Provide labels and certificates from AWI certification program indicating that doors comply with requirements of grades specified.

   a. Contractor shall register the Work under this Section with the AWI Quality Certification Program at www.awiqcp.org or by calling 855-345-0991.

2.4 SOLID-CORE FIVE-PLY FLUSH WOOD VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Doors <**Insert drawing designation>**:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Eggers Industries.
    b. Oshkosh Door Company.
    c. VT Industries Inc.
    d. Masonite Corporation (Mohawk)

2. Performance Grade:

    a. ANSI/WDMA I.S. 1A Heavy Duty unless otherwise indicated on Drawings.

3. Architectural Woodwork Standards Grade: Premium.
4. Faces: Single-ply wood veneer not less than 1/50 inch thick.

    a. Species: Red oak.
    b. Cut: Plain sliced (flat sliced).
    c. Match between Veneer Leaves: Slip match.
    d. Assembly of Veneer Leaves on Door Faces: Center-balance match.
    e. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
    f. Room Match: Provide door faces of compatible color and grain within each separate room or area of building.

5. Exposed Vertical and Top Edges: Same species as faces or a compatible species - Architectural Woodwork Standards edge Type A.

    a. Fire-Rated Single Doors: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed vertical edges.
    b. Fire-Rated Pairs of Doors: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
        1) Finish steel edges and astragals with baked enamel same color as doors.
    c. Mineral-Core Doors: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

6. Core to be Structural Composite Lumber (SCL) Core Stave Lumber Core replacement as described by AWI section 1300. SCL core as manufactured under the product name of Timberstrand™ LSL. Stiles shall be l" minimum laminated hardwood or structural composite lumber (SCL) veneered over with veneer matching face veneer. Rails will be l l/8" minimum mill option hardwood or structural composite lumber (SCL). Stiles and rails shall be securely bonded to the core then abrasively planed as an assembly before veneering.

    a. Screw-Holding Capability: 475 lbf in accordance with WDMA T.M. 10.

7. Core for Fire-Rated Doors: As required to achieve fire-protection rating indicated on Drawings.
   a. Blocking for Mineral-Core Doors: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated on Drawings as needed to eliminate through-bolting hardware. Provide blocking for door closers, exit devices, mortise locks and other surface mounted hardware.
8. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated.

1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
2. Comply with NFPA 80 requirements for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied.

1. Locate hardware to comply with DHI-WDHS-3.
2. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
3. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
4. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.
5. Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

C. Openings: Factory cut and trim openings through doors.

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."

2.6 FACTORY FINISHING

A. Comply with referenced quality standard for factory finishing.

1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
2. Finish faces, all four edges, edges of cutouts, and mortises.
3. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.

B. Factory finish doors.

C. Transparent Finish:

1. Architectural Woodwork Standards Grade: Premium.

2. Finish: Architectural Woodwork Standards System-9, UV Curable, Acrylated Epoxy, Polyester or Urethane.
3. Staining: Match Architect's sample.
4. Effect: Semi filled finish, produced by applying an additional finish coat to partially fill the wood pores.
5. Sheen: Semigloss.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

C. Install frames level, plumb, true, and straight.

1. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
2. Anchor frames to anchors or blocking built in or directly attached to substrates.

a. Secure with countersunk, concealed fasteners and blind nailing.
b. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork.

1) For factory-finished items, use filler matching finish of items being installed.

3. Install fire-rated doors and frames in accordance with NFPA 80.
4. Install smoke- and draft-control doors in accordance with NFPA 105.

D. Job-Fitted Doors:

1. Align and fit doors in frames with uniform clearances and bevels as indicated below.

a. Do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors.

2. Machine doors for hardware.

3. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
4. Clearances:

    a. Provide 1/8 inch at heads, jambs, and between pairs of doors.
    b. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated on Drawings.
    c. Where threshold is shown or scheduled, provide1/4 inch from bottom of door to top of threshold unless otherwise indicated.
    d. Comply with NFPA 80 for fire-rated doors.

5. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
6. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.

E. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

F. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 08 41 13

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Storefront framing.
2. Manual-swing entrance doors.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

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.

B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.

1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
2. Include full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:

a. Joinery, including concealed welds.
b. Anchorage.
c. Expansion provisions.
d. Glazing.
e. Flashing and drainage.

3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

D. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Energy Performance Certificates: For aluminum-framed entrances and storefronts, accessories, and components, from manufacturer.

1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance and storefront.

C. Product Test Reports: For aluminum-framed entrances and storefronts, for tests performed by manufacturer and witnessed by a qualified testing agency.

D. Field quality-control reports.

E. Sample warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.8 MOCKUPS

A. 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 in-place mockup of typical wall area as shown on Drawings.
2. Testing shall be performed on mockups according to requirements in "Field Quality Control" Article.
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.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:

a. Thermal stresses transferring to building structure.
b. Glass breakage.
c. Noise or vibration created by wind and thermal and structural movements.
d. Loosening or weakening of fasteners, attachments, and other components.
e. Failure of operating units.

B. Structural Loads:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

C. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.

A. Structural: Test according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.

3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

E. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Fixed Framing and Glass Area:

a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft.

2. Entrance Doors:

a. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

F. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 8 lbf/sq. ft.

G. Energy Performance: Certify and label energy performance according to NFRC as follows:

1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.44 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
2. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 62 (frame) as determined according to NFRC 500.

H. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 STOREFRONT SYSTEMS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Kawneer North America; Heavy Wall Trifab VersaGlaze Framing System l, or a comparable product by one of the following:

1. EFCO Corporation.
2. Oldcastle BuildingEnvelope.
3. YKK AP America Inc.

B. Framing Members: Manufacturer's extruded-or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Exterior Framing Construction: Thermally broken.
2. Glazing System: Retained mechanically with gaskets on four sides.
3. Glazing Plane: Center.
4. Finish: High-performance organic finish.
5. Fabrication Method: Field-fabricated stick system.
6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.3 ENTRANCE DOOR SYSTEMS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Kawneer; 500 Heavy Wall Entrances, or a comparable product by one of the following:

1. EFCO Corporation.
2. Oldcastle BuildingEnvelope.
3. YKK AP America Inc.

B. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.

1. Door Construction: 2-inch overall thickness, with 3/16-inch-thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
2. Door Design: As indicated.
3. Glazing Stops and Gaskets: Snap-on, extruded-aluminum stops and preformed gaskets.

a. Provide nonremovable glazing stops on outside of door.

2.4 ENTRANCE DOOR HARDWARE

A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."

2.5 GLAZING

A. Glazing: Comply with Section 088000 "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer.

2.6 MATERIALS

A. Sheet and Plate: ASTM B 209.

B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.

C. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.

D. Structural Profiles: ASTM B 308/B 308M.

E. Steel Reinforcement:

1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.
4. Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.

2.7 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.

C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30mil thickness per coat.

2.8 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Provisions for field replacement of glazing from exterior.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

1. At interior and exterior doors, provide compression weather stripping at fixed stops.

F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
2. At exterior doors, provide weather sweeps applied to door bottoms.

G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.9 ALUMINUM FINISHES

A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF or FEVE resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color: White, gloss as selected by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, 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. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full sealant bed as specified in Section 079200 "Joint Sealants" to produce weathertight installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install glazing as specified in Section 088000 "Glazing."

F. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.

G. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
3. Alignment:

a. Where surfaces about in line or are separated by reveal or protruding element up to 1/2-inch-wide, limit offset from true alignment to 1/16 inch.
b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
c. Where surfaces are separated by reveal or protruding element of 1-inch wide or more, limit offset from true alignment to 1/4 inch.

4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.3FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Field Quality-Control Testing: Perform the following test on aluminum-framed entrances.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.

a. Perform a minimum of three tests in areas as directed by Architect.

2. Air Infiltration: ASTM E 783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. at a static-airpressure differential of 1.57 lbf/sq. ft.

a. Perform a minimum of two tests in areas as directed by Architect.

3. Water Penetration: ASTM E 1105 at a minimum uniform and cyclic static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft., and shall not evidence water penetration.

C. Aluminum-framed entrances will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 08 41 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hardware for swinging Aluminum, Hollow Metal and Wood Door Openings.

B. Related Sections:

1. Section 01 25 13 – Product Substitution Procedures
2. Section 06 20 00 – Finish Carpentry
3. Section 08 11 13 – Hollow Metal Doors and Frames
4. Section 08 14 16 – Flush Wood Doors
5. Section 08 41 13 – Aluminum – Framed Entrances and Storefronts
6. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables

1.2 REFERENCES

A. Use the following references to properly detail, schedule, furnish and install finish hardware items.

1. NFPA 80 – Standard for Fire Doors and Other Opening Protectives (2007)
2. DHI Installation Guide for Doors and Hardware (1984)
3. DHI Sequence and Format for the Hardware Schedule (1996)
4. ANSI/BHMA A156.4 – Door Controls – Closers (2013)
5. ANSI/BHMA A156.13 – Mortise Locks and Latches Series 1000 (2012)
6. ANSI/BHMA A156.18 – Materials and Finishes (2012)

1.3 SUBMITTALS

A. Schedule:

1. Provide submittals in accordance with 01 33 00 – Submittal Procedures.
2. Provide hardware schedule in vertical format on 8-1/2-inch by 11-inch paper or electronic format. Conform to DHI publication Sequence and Format for Hardware Schedule using Architect's door numbers and hardware set numbers.
3. Provide elevation drawings for openings with electrical hardware and access control devices with each hardware schedule. Include illustration of opening, operational description, electrified hardware components, legend, approximate mounting location and size of enclosures, size and quantity of conductors, facility name and date.

B. Product Data: Provide one set of manufacturer's catalog and technical data for each hardware item used, highlighting design, function, fasteners, accessories, and options to facilitate review with each hardware schedule submitted.

C. Templates: Provide two sets of manufacturer's templating information for mortised and template hardware upon receipt of approved hardware schedule to the door and frame supplier(s). Include requirements for internal reinforcements required for surface mounted hardware.

D. Wiring Diagrams:

1. Three sets point-to-point diagrams specially developed for each opening that requires electrical hardware, with hardware delivery to jobsite. Reference elevation drawings submitted with hardware schedule using Architect's opening numbers.
2. Three sets riser diagrams for openings requiring power supplies or access control. Include placement of power supplies, distance of wire runs from power supply, cable quantity and number and gauges of wires.

E. Keying Schedule: Arrange meeting with Owner, Architect and finish hardware supplier to determine keying requirements immediately upon receipt of finish hardware schedule.

1.4 CLOSEOUT SUBMITTALS

A. Furnish operations and maintenance manual is accordance with Section 01 78 28 – Operations and Maintenance Data and as follows:

1. Furnish one copy of manual at date of Substantial Completion in a 2-1/2-inch thick binder labeled with project information, date and name and contact information for the hardware supplier.
2. Include in manual:

a. Copy of approved hardware schedule, including door numbers and locations. Highlight fire rated door to aid in annual fire door inspection.
b. Copy of approved keying schedule.
c. Catalog data for each product.
d. As-installed "wiring diagrams" for each opening connected to power.
e. Parts list for locksets, exit devices, and door closers.
f. Installation templates and instructions.
g. Warranty information.
h. Name, address, and phone number of local representatives for each manufacturer.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Materials:

1. Screws and Fasteners: Fifty of each screw and fastener required for general maintenance of hinges, locks, closers, exit devices, and sealing systems.
2. Deliver to Owner remaining finish hardware fasteners and special installation tools upon completion of Project.

1.6 QUALITY ASSURANCE

A. Supplier:

1. Furnish hardware from recognized supplier who has warehousing facility within 100 miles of project location, and who has actively supplied hardware for similar projects in the vicinity for a minimum of five years.
2. Supplier shall employ an Architectural Hardware Consultant (AHC), as certified by Door and Hardware Institute, on staff full time to administer and supervise project.

B. Installer: Install hardware using installers who have actively installed commercial door hardware for a minimum of five years, and are familiar with hardware installation of type required on this Project.

C. Pre-Installation Meeting:

1. Prior to installation of hardware, arrange for manufacturer's representatives of locksets, door closers, and exit devices to hold a jobsite meeting to instruct the installing personnel on the proper installation of their products.
2. Send a letter of compliance, indicating when this meeting was held, and who was in attendance, to the Architect and Owner.

D. Fire Rated Door Openings:

1. Comply with NFPA 80.
2. Furnish nationally recognized testing agency label or stamp on hardware for labeled openings.
3. Only labeled locks or latches or fire exit hardware can be used on fire rated openings.
4. Where UL requirements conflict with Drawings or Specifications, furnish hardware conforming to the UL requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery:

1. Jointly check in hardware, upon delivery to jobsite, against approved hardware schedule with hardware supplier. Record shortage or damage and replace or repair as necessary.
2. Deliver hardware to be installed during fabrication of doors and frames, to manufacturer.

B. Storage:

1. Store hardware in a secure, dry, temperature-controlled room on shelving to protect against loss, theft and damage.
2. Store items too long for shelving on pallet, off the floor.

C. Marking and Packaging:

1. Deliver hardware to jobsite in manufacturer's original packaging marked to correspond with approved hardware schedule with Architect's door numbers and hardware sets.
2. Mark all locksets, exit devices, cylinders, auxiliary hardware and key switches with keyset symbol.
3. Replace any wet or damaged packaging with new.

1.8 WARRANTY

A. Furnish warranties in accordance with Section 01 78 36 – Warranties. Extended or limited warranties shall be as follows:
   1. Mortise Locks: Lifetime
   2. Door Closers: Thirty (30) Years
   3. Exit Devices: Five (5) Years

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The following manufacturers were used in the hardware sets.

1.	Butt Hinges	Best	BES
2.	Continuous Hinges	Best	BES
3.	Locks and Latchsets	Corbin	CORB
4.	Cylinders and Cores	Corbin	CORB
5.	Surface Closers	dormakaba	DK
6.	Exit Devices	Precision	PRE
7.	Overhead Stop/Holders	ABH	ABH
8.	Door Pulls	Trimco	TRM
9.	Flushbolts	Trimco	TRM
10.	Protection Plates	Trimco	TRM
11.	Wall/Floor Stops	Trimco	TRM
12.	Thresholds and Gasketing	National Guard	NGP
13.	Silencers	Trimco	TRM

B. Submit requests for substitution in accordance with Section 01 25 13 Product Substitution requirements and as follows:

1. Provide catalog data with product information highlighted or bubbled to facilitate review in addition to physical samples in the specified finish and function. Product must meet or exceed level or design intended and/or function established by specified products.

2.2 MATERIALS

A. Screws and Fasteners:

1. Provide manufacturer's recommended fasteners of proper type, material and finish.
2. Provide self-tapping screws for sweeps and stop applied weatherstripping.
3. Utilize through-bolts for the attachment of door closers and exit devices on non-reinforced doors only. Finish: match door face.
4. Exposed screw heads: phillips type.

C. Hinges:

1. Type:

a. Five-knuckle, full mortise, ball bearing.
b. Furnish heavy weight hinges on heavy doors and doors expected to have high frequency use.

2. Quantity:

a. One pair of hinges for all doors up to 5 feet high. Furnish one additional hinge for every 2'-6" in height or fraction thereof.
b. Four hinges at dutch doors up to 7'-6" in height.

3. Size:

a. For 1-3/4-inch thick doors up to 3 feet wide: 4 ½-inches high
b. For 1-3/4-inch thick doors over 3 feet wide: 5-inches high
c. For all doors over 1-3/4-inches thick: 5-inches high
d. Size in width shall minimally clear door trim.

4. Application:

    a. NRP (non-removable pin) at exterior doors and reverse bevel doors with locking hardware.
    b. Electric hinges: have sufficient number of concealed wires to accommodate electrical function of hardware. Furnish junction box and mortar shield.

5. Acceptable manufacturers and types:

Type	Stanley	McKinney	Hager
Standard Weight	FBB179	TB2714	BB1179
Heavy Weight	FBB168	T4B3786	BB1168
S/S Standard Weight	FBB191	TA-TB2314	BB1191
S/S Heavy Weight	FBB199	T4A-T4B3386	BB1199

D. Continuous Hinges:

1. Configuration appropriate for type, inset, and thickness of door. Coordinate with door manufacturer.
2. Meet UL fire label listing requirements at UL rated openings. Include fire pins as required by manufacturer.
3. Acceptable manufacturers and types:

Door Type	Stanley	ABH	Select
Aluminum	661HD	A110HD	SL11HD
Hollow Metal	662HD	A240HD	SL24HD

E. Door Bolts:

1. Flushbolts:

    a. Manual Flushbolts: Two for inactive leaf of locked pairs of doors at non-occupied rooms.
    b. Self-Latching Flushbolts: One pair for inactive leaf at pairs of doors where inactive leaf is not required for egress.
    c. Automatic Flushbolts: One pair at fire rated doors, and occupied rooms required for egress.
    d. Acceptable manufacturers and types:

Bolt/Door Type	Trimco	Burns	ABH
Manual Metal	3917	590	1855
Manual Wood	3913	591	1857
Automatic Metal	3810	7842	1860
Automatic Wood	3815	7942	1862
Self-Latching Metal	3820 x 3810	7845	1863
Self-Latching Wood	3825 x 3815	7945	1864

F. Locksets:

1. Mortise Locks:

    a. Conform to ANSI/BHMA A156.13, Series 1000 Operational Grade 1.
    b. Latchbolt with appropriate throw for fire rated doors and pairs of doors in accordance with manufacturers listing.
    c. Lock functions as specified in hardware schedule.
    d. Electrical functions as specified in hardware schedule, 24VDC.

e. Lever design: 15H
f. Backset: 2-3/4-inch
g. Strike single door: ANSI 4-7/8-inch with proper lip length to minimally clear trim.
h. Strike pair of doors: flat lip strike sized to fit flush with face of door.
i. Furnish wrought strike box.
j. Lever trim shall function in a bi-directional motion.
k. Acceptable manufacturers and types:

Corbin (ASSA Abloy)
CLX33905 NZD series (No Substitutions)

2. Cylinders:
   a. Provide mortise and rim cylinders and cores from same manufacturer as locksets, for all locksets, exit devices, cylinder dogging, key switches and auxiliary hardware.
   b. Appropriate cam and blocking rings for proper installation

G. Keys & Keying

1. Cylinders: 7-pin, interchangeable core and keyed to Corbin factory registered Masterkey System. **No Substitutions.**
2. Provide construction cores and keys during construction period. Construction control and operating keys and cores are not part of permanent keying system or furnished on same keyway (or key section) as permanent keying system.
3. Permanent Keys and Cores: Prepare permanent cores and keys in accordance with keying schedule. Provide Masterkeys and other Security Keys.
4. Furnish keys in the following quantities:
   a. 4 each Masterkeys per new Masterkey set.
   b. 4 each Grand Master Keys if required.
   c. 2 each Change keys each keyed core.
   d. 6 each Construction Masterkeys.
   e. 2 each Construction Control keys.
   f. 2 each Control keys.
5. Install permanent cores in locksets.
6. Return construction ores to hardware supplier.

H. Exit Devices:

1. UL-listed for fire at fire door assemblies, and UL listed for panic at non-rated door assemblies.
2. Size exit devices to proper door width and height.
3. Stainless Steel deadlocking ¾ -inch throw latch bolt.
4. LBR (less bottom rod) where scheduled to eliminate use of floor mounted strikes.
5. Cylinders for exit devices with cylinder dogging or locking trim.
6. Exit device channel assembly must be a one-piece assembly with no visible screw heads on the back of the channel assembly.
7. Exit device touch bar should not create grab points when in the dogged down position.
8. Exit device trim must have a four-point mounting foot for installation.
9. Exit device touch bar will eliminate pinch point between touch bar and channel assembly when depressed.
10. All exposed metals shall be manufactured in the same finish as the specified finish for the project.

11. No exposed plastic parts will be accepted.
12. All latchbolts shall be deadlocking for all applications.
13. Electrical functions as scheduled in sets. Provide power supply and power transfer from same manufacturer as electrified exit device.
14. Strike: as recommended by manufacturer.
15. Lever design: To match lockset trim.
16. Acceptable manufacturers and types:

Precision (dormakaba)	Sargent (ASSA Abloy)	Von Duprin (Allegion)
Apex 2000 Series	19-43-GL 80 Series	98 Series

I. Surface Door Closers:

1. Conform to ANSI/BHMA A156.4 Grade 1.
2. Heavy duty high silicon aluminum alloy or cast iron body closers.
3. Furnish manufacturers recommended size, arms and configuration for door and frame application required.
4. Closer arms shall accommodate project applications as specified.
5. Furnish brackets, spacers, support shoes, and plates for complete and proper installation.
6. Acceptable manufacturers and types:

Best (dormakaba)	LCN (Allegion)	Norton (ASSA Abloy)
8900 Series	4050A Series	7500 Series

J. Overhead Door Stop:

1. Provide overhead stop or overhead stop/holder for interior doors as specified. Provide overhead stop for interior doors and at any door that swings more than 140 degrees before striking a wall, open against equipment, casework, sidelights, and/or where conditions do not allow a wall stop or a floor stop presents a tripping hazard.
2. Where overhead holders are specified provide friction type at doors without a closer and positive type at doors with a closer.
3. Acceptable manufacturers:

ABH	Dorma (dormakaba)	Rixson (ASSA)	Glynn Johnson (Allegion)
4420 Series	710 Series	10 Series	450 Series
1020 SL Series		6 Series	100S Series

K. Door Trim:

1. Provide push plates 6 inches wide x 16 inches high x 0.050 inch thick and beveled 4 edges. Where width of door stile prevents use of 6 inches wide plate, adjust width to fit.
2. Provide pull plates 4 inches wide x 16 inches high x 0.050 inch thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches wide plate, adjust width to fit.
3. Acceptable manufacturers:

Type	Trimco	Burns	Rockwood
Push/Pull Plate Combo	1035 Series	As Approved	As Approved
Flush Pull	1111A	459C	RM780
Offset Door Pull	AP433	VP4252	RM3312

L. Protection Plates:

1. Where bottom rail allows, furnish 10-inch high kick plates and 6-inch high mop plates.
2. Material: 0.050-inch thick stainless steel plates with four beveled edges.
3. Countersink screw heads at wood doors.
4. Width: 2-inch less door width on stop (push) side and 1-inch less door width on face (pull) side.
5. Acceptable manufacturer and types:

Trimco	Burns	Rockwood
K0050	KP50	K1050

M. Door Stops:

1. Convex, cast, wall stops.
2. Furnish fastener suitable for wall condition.
3. Provide wedge type stop for doors with push/pulls.
4. Where wall stops are inappropriate provide universal dome type floor stops.
5. Acceptable manufacturers and types:

Type	Trimco	Burns	Rockwood
Wall Stop	1270CXSV	as Approved	As Approved
Floor Stop	1211	521	441H

N. Thresholds and Gasketing:

1. Thresholds:

a. Returned closed ends at openings where threshold extends beyond frame face.
b. Bumper threshold with silicone insert where scheduled.
c. Acceptable manufacturers and types:
d. Coordinate door undercuts with door hardware.

Type	National Guard	Pemko	Reese
Saddle	513	271	S405
Saddle	425	171	S205A
Bumper	896S ADJ	As Approved	As Approved

2. Gasketing:

a. Rigid jamb weatherstip with replaceable neoprene insert.
b. Include self-adhesive two-sided tape in addition to manufacturer's standard fastener.
c. Meeting-stile gasketing required at exterior pairs of doors and doors in smoke partitions.
d. TPE adhesive fire/smoke gasketing at fire and smoke "S" labeled openings
e. Door sweep with neoprene insert for exterior out-swing doors.
f. Acceptable manufacturers and types:

Type	National Guard	Pemko	Reese
Rigid	700N	2891_PK	755N
Smoke	5020	S442	798
Seals	2525	S88	638
Door Sweep	200N	315N	323
Mullion Seal	5100N	5110	628B

O. Silencers:

1. Grey rubber silencers with injector tool.
2. Three silencers at single doors and two silencers at pairs.
3. Acceptable manufacturers and types:

Trimco	Rockwood	Burns
1229A	608	500

2.3 FINISHES

A. Conform to ANSI/BHMA A156.18.

1.	Butt Hinges	630	Stainless Steel
2.	Locks and Latches	626	Satin Chrome
3.	Exit Devices	630	Satin Stainless Steel
4.	Door Closers	689	Spray Painted Aluminum
5.	Pull Plates	630	Satin Stainless Steel
6.	Protection Plates	630	Satin Stainless Steel
7.	Stops and Holders	630	Satin Stainless Steel
8.	Thresholds/Gasket	AL	Anodized Mil Finished Aluminum

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify doors and frames are plumb, square, level and true and free from defects that would prevent proper installation of finish hardware.

B. Verify power is run to doors requiring electrified hardware.

C. Wash down masonry walls and complete painting and staining of doors and frames prior to installation of hardware.

D. Complete finish flooring at doorways.

E. Correct conditions that inhibit a proper installation before continuing with work.

3.2 INSTALLATION

A. Install hardware in compliance with the DHI publication, Installation Guide for Doors and Hardware.

B. Drill and countersink items not factory prepared for fasteners.

C. Mount closers on room-side of corridor doors, inside of exterior doors, and stair-side of stairway doors. Use necessary arms, brackets, spacers and plates to accommodate auxiliary hardware and special applications.

D. Install fire door assemblies to maintain clearances at door edge to frame and meeting edge of pairs of doors in compliance with NFPA 80, providing 1/8-inch clearance at the hinge edge, lock edge, head and

between pairs. Provide maximum 3/4-inch undercut at door bottom. Where panic thresholds are used, undercut door to allow 1/8-inch clearance between door and threshold.

E. Trim, cut, and notch thresholds and saddles neatly to minimally fit the profile of the door frame. Set thresholds in bed of mastic sealant, forming tight seal between threshold and surface to which set.

F. Use only fasteners furnished by manufacturer for installation as recommended by manufacturer.

G. Install blocking material for all wall mounted door stops at height appropriate to contact door trim.

H. Install weather-strip prior to installation of door closers and exit devices. Do not cut or notch weather-strip.

I. Locate electric hinges at second hinge from bottom of frame.

J. Termination of wiring: Ensure wiring is in place and is connected for proper operation of hardware.

3.3 FIELD QUALITY CONTROL

A. Verify doors open and close smoothly without rubbing or catching and have positive latching where scheduled. Verify fire rated doors are installed with clearances in compliance with NFPA 80.

B. Test electrified hold open devices tied into fire alarm system to confirm release upon activation of fire alarm. Test electrified hardware and access control to verify systems operate as directed in mode of operation. Where hardware is found to be inoperable, repair or replace with new.

3.4 ADJUSTING AND CLEANING

A. Upon substantial completion, make final adjustments to door closers and other items of hardware after balance of heating and ventilating equipment to ensure doors close and latch properly.

B. Clean and polish all exposed hardware surfaces in accordance with manufacturer’s recommended procedures.

C. Clean or repair pencil or tool marks from adjacent surfaces damaged or soiled by work of this Section.

D. Recycle cardboard boxes and paper products used in packaging and transport of finish hardware.

3.5 PROTECTION

A. Remove hardware prior to painting or finishing door and frame. Wrap or mask exposed hardware that cannot be removed until date of substantial completion to avoid exposure to paint, solvents, and abuse.
B. Repair or replace hardware damaged during construction at least two weeks prior to date of substantial completion.

3.6 SCHEDULES

A. Should items of hardware not definitely specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.

B. Where items of hardware are not definitely or correctly specified, are required for completion of the Work, a written statement of such omission, error, or other discrepancy to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.

Manufacturer List

Code	Name
AB	ABH Manufacturing Inc.
BES	Best Access Systems
Corbin	CORB
DOR	Dorma Door Controls
NGP	National Guard
PRE	Precision
TRI	Trimco

Option List

Code	Description
CSK	Counter Sinking Screws of Kick and Mop Plates
BSHD	Blade Stop Spacer
7/8"LTC	7/8" Lip-To-Center Strike
5001-118	ANSI Strike - 1 1/8" Lip
B4E-HEAVY-KP	Beveled 4 Edges – Kick / Mop Plates
1/4-20 SSMS/EA	Stainless Machine Screws/Expansion Anchors

Finish List

Code	Description
AL	Aluminum
626	Satin Chromium Plated
630	Satin Stainless Steel
689	Aluminum Painted
316S	316 Satin Stainless Steel
626W	Weatherized Satin Chrome
GREY	Grey
US26D	Chromium Plated, Dull
US32D	Stainless Steel, Dull

3.7 HARDWARE SETS

Set # 01 – Existing to remain				
Doors: E106A, 101				
Qty	Description	Manufacturer's Model	Fin	Manf.
No Hardware Required				

Set # 02 – Existing to remain

Doors: E116

Qty	Description	Manufacturer's Model	Fin	Manf.
1	Strike	Type as required	626	

Set # 03

Doors: 102, 103, 104, 110, 110A, 112

Qty	Description	Manufacturer's Model	Fin	Manf.
3	Hinges	FBB179 4 ½" x 4 ½"	26D	BES
1	Office Lock	CLX3351 NZD (Existing I/C Key System)	626	CORB
1	Wall Bumper	1270CX	626	TRI
1	Gasketing	2525 Head & Jambs	Char	NGP

Notes:

Set # 04

Doors: 105

Qty	Description	Manufacturer's Model	Fin	Manf.
3	Hinges	FBB179 4 ½" x 4 ½" NRP	26D	BES
1	Classroom Lockset	CLX3355 NZD (Existing I/C Key System)	626	CORB
1	Wall Bumper	1270CX	626	TRI
3	Door Silencers	1229	Gray	TRI

Set # 05

Doors: 106

Qty	Description	Manufacturer's Model	Fin	Manf.
3	Hinges	FBB179 4 ½" x 4 ½"	26D	BES
1	Passage Set	CLX 3310 NZD	626	CORB
1	Wall Bumper	1270CX	626	TRI
3	Door Silencers	1229A	Gray	TRI

Set # 06

Doors: 101, 108

Qty	Description	Manufacturer's Model	Fin	Manf.
2	Hinges	FBB179 4 ½" x 4 ½" NRP	26D	BES
1	Electrified Hinge	CEFBB179 -66 4 ½" x 4 ½"	26D	BES
1	Electrified Lockset	CLX33905 NZD (Existing I/C Key System)	626	CORB
1	Power Supply	BPS-12-1	PTD	CORB
1	Card Reader	By Security Vendor		

1	Door Closer	8916FC AF89	689	DOR
1	Kick Plate	KO050 8" x 2" LDW B4E csk	630	TRI
1	Wall Bumper	1270CX	626	TRI
1	Gasketing	2525 Head & Jambs	Char	NGP

Operational Description: Entrance via presenting authorized credential to card reader which will render outside lever operable or via mechanical key. Inside lever always free for egress. Jamb and Header to be equipped with necessary conduit for specified hardware components. See electrical drawings for details. Coordinate wiring and installation with GC/ED and Security Contractor.

Set # 07

Doors: 233

Qty	Description	Manufacturer's Model	Fin	Manf.
3	Hinges	FBB179 4 ½" x 4 ½"	26D	BES
1	Passage Set	CLX 3310 NZD	626	CORB
1	Door Closer w/ Stop	8916FC DS	689	DOR
1	Kick Plate	KO050 8" x 2" LDW B4E csk	630	TRI
1	Wall Bumper	1270CX	626	TRI
1	Gasketing	2525 Head & Jambs	Char	NGP

Set # 08 Sliding Barn Type Door

Doors: 232A

Qty	Description	Manufacturer's Model	Fin	Manf.
1	Sliding Door Track	CFT-200-SS Door Kit x (4) Hangers	SS	KNC
2	Door Pull	C-90SP (1 Each Side)	SS	KNC

ALTERNATE - #1

Set # A1-01 – EXTERIOR – C/R

Doors: 107

Qty	Description	Manufacturer's Model	Fin	Manf.
1	Continuous Hinge	661HD x EPT prep	689	BES
1	Electric Power Transfer	EPT-10	630	PRE
1	Panic Device	TS MLR 2103 x 4903 LD	626W	PRE
1	Power Supply	RPSMLR2BB	PTD	PRE
1	Card Reader	By Security Provider		
1	Cylinder & Core	Type as required (Existing I/C Key System)	626	CORB
1	Door Pull	1191-2 10"	626	TRI

1	Door Closer w/ Stop	8916FC SDS BSHD	689	DOR
1	Threshold	896S SIA ssms/ea	AL	NGP
1	Door Sweep	1015V	AL	NGP
1	Rain Cap	16A	AL	NGP
Description of Operation: Entrance by presenting authorized credential to card reader or by mechanical key, Contractor to furnish necessary conduit necessary connections. Coordinate with EC/GC and ALD/ALF supplier.				

Set # A1-02

Doors: 109

Qty	Description	Manufacturer's Model	Fin	Manf.
3	Hinges	FBB179 4 ½" x 4 ½"	26D	BES
1	Office Lock	CLX3351 NZD (Existing I/C Key System)	626	CORB
1	Wall Bumper	1270CX	626	TRI
1	Gasketing	2525	Char	NGP

ALTERNATE - #2

Set # A2-01

Doors: 111

Qty	Description	Manufacturer's Model	Fin	Manf.
3	Hinges	FBB179 4 ½" x 4 ½" NRP	26D	BES
1	Classroom Lockset	CLX3355 NZD (Existing I/C Key System)	626	CORB
1	Door Closer	8916FC AF89	689	DOR
1	Kick Plate	KO050 8" x 2" LDW B4E csk	630	TRI
1	Wall Bumper	1270CX	626	TRI
3	Door Silencers	1229A	Gray	TRI

Set # A2-02

Doors: 115

Qty	Description	Manufacturer's Model	Fin	Manf.
2	Hinges	FBB179 4 ½" x 4 ½" NRP	26D	BES
1	Electrified Hinge	CEFBB179 -66 4 ½" x 4 ½"	26D	BES
1	Electrified Lockset	CLX33905 NZD (Existing I/C Key System)	626	CORB
1	Power Supply	BPS-12-1	PTD	CORB
1	Card Reader	By Security Vendor		
1	Kick Plate	KO050 8" x 2" LDW B4E csk	630	TRI
1	Wall Bumper	1270CX	626	TRI
1	Gasketing	2525 Head & Jambs	Char	NGP

Operational Description: Entrance via presenting authorized credential to card reader which will render outside lever operable or via mechanical key. Inside lever always free for egress. Jamb and Header to be equipped with necessary conduit for specified hardware components. See electrical drawings for details. Coordinate wiring and installation with GC/ED and Security Contractor.

END OF SECTION

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior partitions.
2. Suspension systems for interior ceilings and soffits.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of code-compliance certification for studs and tracks.

B. Evaluation reports for [**embossed, high-strength steel studs and tracks**] [**firestop tracks**] [**post-installed anchors**] [**and**] [**power-actuated fasteners**].

1.4 QUALITY ASSURANCE

A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of [**the Certified Steel Stud Association**] [**the Steel Framing Industry Association**] [**or**] [**the Steel Stud Manufacturers Association**].

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 E119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C645 requirements for steel unless otherwise indicated.

B. Studs and Tracks: ASTM C645. **Use either conventional steel studs and tracks or embossed, high-strength steel studs and tracks.**
1. Minimum Base-Steel Thickness: **As required by performance requirements for horizontal deflection**
2. Depth: **As indicated on Drawings**.

C. Firestop Tracks: Top track manufactured to allow partition heads to expand and contract with movement of 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.

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Steel Thickness: **0.0296 inch (0.752 mm)**.

E. Cold-Rolled Channel Bridging: Steel, 0.0538-inch (1.367-mm) minimum base-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Depth: **As indicated on Drawings**.
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.

F. Hat-Shaped, Rigid Furring Channels: ASTM C645.
1. Minimum Base-Steel Thickness: **As indicated on Drawings** >.
2. Depth: **As indicated on Drawings**.

G. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.
1. Configuration: **hat shaped**.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide **one of** the following:

1. Asphalt-Saturated Organic Felt: ASTM D226/D226M, 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 INSTALLATION, GENERAL

A. Installation Standard: ASTM C754.

1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C841 that apply to framing installation.
2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C1063 that apply to framing installation.
3. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C844 that apply to framing installation.
4. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

END OF SECTION 092216

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 29 00

GYPSUM BOARD

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Tile backing board.

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-long length for each trim accessory indicated.

C. Samples for Verification: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch-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 interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 -PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, 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 GYPSUM BOARD, GENERAL

A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Abuse-Resistant Gypsum Board: ASTM C 1396/C 1396M gypsum board, tested according to ASTM C 1629/C 1629M.

1. Basis of Design Product Subject to compliance with requirements, provide National Gypsum Company; Gold Bond BRAND Hi-Abuse® XP Gypsum Board, or comparable product by one of the following:

a. CertainTeed Corporation.
b. Continental Building Products, LLC.
c. Georgia-Pacific Gypsum LLC.
d. USG Corporation.

1) Core: 5/8 inch, Type X.
2) Surface Abrasion: ASTM C 1629/C 1629M, meets or exceeds Level 2 requirements.
3) Indentation: ASTM C 1629/C 1629M, meets or exceeds Level 1 requirements.
4) Soft-Body Impact: ASTM C 1629/C 1629M, meets or exceeds Level 1 requirements.
5) Long Edges: Tapered.
6) Mold and Moisture Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, with manufacturer's standard edges.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

   a. CertainTeed Corporation.
   b. Custom Building Products.
   c. James Hardie Building Products, Inc.
   d. National Gypsum Company.
   e. USG Corporation.

2. Thickness: 5/8 inch.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
2. Shapes:

   a. Cornerbead.
   b. LC-Bead: J-shaped; exposed long flange receives joint compound.
   c. L-Bead: L-shaped; exposed long flange receives joint compound.
   d. U-Bead: J-shaped; exposed short flange does not receive joint compound.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

   a. Fry Reglet Corp.
   b. Gordon, Inc.
   c. Pittcon Industries.

3. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221, Alloy 6063-T5.
4. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape: Provide Fire and non-fire rated type to suit application.

1. Interior Gypsum Wallboard: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Wallboard: 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 compound or drying-type, all-purpose compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound or drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound or drying-type, all-purpose compound.

D. Joint Compound for Tile Backing Panels:

1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

C. 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 thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Acoustical 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.

F. 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 support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 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 of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4-to 3/8-inch-wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4-to 1/2-inch-wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in locations indicated on Drawings.

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 as 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.

C. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistancerated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

E. Curved Surfaces:

1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12-inch-long straight sections at ends of curves and tangent to them.
2. For double-layer construction, fasten base layer to studs with screws 16 inches o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches o.c.

3.4 APPLYING TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A108.11, at locations indicated to receive tile.

B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect at ceiling and wall intersections.

1. Ceilings: Provide perimeter relief at ceiling perimeters maximum surface dimension not to exceed 50 feet.
2. Walls: Provide control joints maximum of 30 feet on center.
3. At “L”, “T” or “U” shaped intersections verify joint locations with the Architect prior to starting board installation.

3.6 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 2: Ceiling plenum and other concealed areas.
2. Level 4: Storage and Mechanical areas.
3. Level 5: All other areas. Level 5 finish may be achieved by finishing joints to Level 5 finish and applying one of the following surfacers to achieve 13 mil DFT (minimum):

a. “Tuff-Hide Primer-Surfacer”; USG.
b. ProForm Brand “Surfacer/Primer”; National

E. Moisture resistant board shall be finished to same requirements as above with addition of skim coat over entire board surface as required to prepare for finishes.

F. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.7 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 09 29 00

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for ceilings.

B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Submittals and samples must be issued within 90 days of the start of construction.

B. Product Data: For each type of product.

C. Samples: For each exposed product and for each color and texture specified, 6 inches in size.

D. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.

1. Acoustical Panel: Set of 6-inch-square Samples of each type, color, pattern, and texture.
2. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch-long Samples of each type, finish, and color.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Suspended ceiling components.
2. Structural members to which suspension systems will be attached.
3. Size and location of initial access modules for acoustical panels.
4. Items penetrating finished ceiling including the following:

a. Lighting fixtures.
b. Air outlets and inlets.
c. Speakers.
d. Sprinklers.
e. Access panels.

5. Perimeter moldings.

A. Qualification Data: For testing agency.

C. Product Test Reports: For each acoustical panel ceiling, for tests performed by a qualified testing agency.

D. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.7 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. Acoustical Ceiling Panels: Provide four standard cartons of each type acoustic units to Owner, upon substantial completion.
2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.
3. Hold-Down Clips: Equal to 2 percent of quantity installed.
4. Impact Clips: Equal to 2 percent of quantity installed.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

PART 2 -PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.

2. Smoke-Developed Index: 450 or less.

B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 ACOUSTICAL PANELS, GENERAL

A. Source Limitations:

1. Acoustical Ceiling Panel: Obtain each type from single source from single manufacturer.
2. Suspension System: Obtain each type from single source from single manufacturer.

B. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from single source from single manufacturer.

C. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.

D. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface according to ASTM E 795.

E. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 ACOUSTICAL PANELS:

A. Basis-of-Design Product: Subject to compliance with requirements, provide products by Armstrong World Industries, Inc. or a comparable product by one of the following:

1. CertainTeed Corporation.
2. Rockfon (Roxul Inc.).
3. USG Corporation.

B. Acoustical Suspended Ceiling Panel Types:

1. TYPE A - ACT-1 ‘Armstrong’ Ultima High NRC

a. Size: 24” x 24” x 7/8””, unless otherwise indicated on the Drawings.
b. Composition: Wet-formed mineral fiber with acoustically transparent membrane.
c. Fire Performance; Class A: ASTM E84 surface burning characteristics. Flame Spread Index of 25 or less. Smoke Developed Index of 50 or less. UL labeled
d. Humidity/Sag Resistance
e. Recycled Content: Contains greater than 50% total recycled content.
f. Face Finish: White textured.
g. Edge: Square Lay-in.

2.5 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.

B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch-diameter wire.

D. Angle Hangers: Angles with legs not less than 7/8-inch-wide; formed with 0.04-inch-thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch-diameter bolts.

E. Stabilizer Bars: Manufacturer's standard perimeter stabilizers.

2.6 METAL SUSPENSION SYSTEM

A. Basis-of-Design Product: Subject to compliance with requirements, provide products by Armstrong World Industries, Inc; or a comparable product by one of the following:

1. CertainTeed Corporation.
2. Rockfon (Roxul Inc.).
3. USG Corporation.

B. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M and designated by type, structural classification, and finish indicated.

C. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 coating designation; with prefinished 15/16-inch-wide metal caps on flanges.

1. Structural Classification: Heavy-duty system.
2. End Condition of Cross Runners: Override (stepped) or butt-edge type.
3. Face Design: Flat, flush.
4. Cap Material: Aluminum.
5. Cap Finish: Painted white.

2.7 METAL EDGE MOLDINGS AND TRIM

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Armstrong World Industries, Inc.

2. CertainTeed Corporation.
3. Chicago Metallic Corporation.
4. Fry Reglet Corporation.
5. Gordon, Inc.
6. USG Corporation.

B. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated on drawings or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

1. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners unless otherwise indicated.
2. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.

C. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements and the following:

1. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils. Comply with ASTM C 635/C 635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
2. Where indicated on the Drawings: Provide 2” High aluminum extruded perimeter trim. Factory finished to match approved samples. Factory or field cut, and mitered to match approved shop drawings.

PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

A. Install acoustical panel ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.

1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
8. Do not attach hangers to steel deck tabs.
9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim unless approved by Architect.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. Arrange directionally patterned acoustical panels as follows:

a. As indicated on reflected ceiling plans.

F. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
G. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
H. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
I. Install hold-down and impact clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated.

a. Hold-Down Clips: Space 24 inches on all cross runners.

J. Protect lighting fixtures and air ducts to comply with requirements indicated for fireresistance-rated assembly.

3.4 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 09 65 13

RESILIENT BASE AND 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. Thermoset-rubber base.
2. Rubber molding accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. 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 long.

C. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.4 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. Furnish not less 6 inches, 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 or more than 90 deg F.

1.6 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg Fin spaces to receive resilient products during the following 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 or more than 95 deg F

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

2.2 THERMOPLASTIC-RUBBER BASE (CB-1) & (CB-2)

A. Basis of Design: **Tarkett Johnsonite, Designer Wall Base, Perceptions Recess Toe** Subject to compliance with requirements, or comparable products by one of the following:

B. Thickness: 0.125 inch.
1. Height**:** 4.25 inches

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.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

C. Do not install resilient products until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

D. Immediately before installation, sweep and vacuum clean substrates to be covered by 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.

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 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

SECTION 09 65 52

LUXURY VINYL PLANK AND TILE FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Smooth resilient tile flooring.

1.2 RELATED SECTIONS

A. Division 03 Section 03 30 00 “Cast-in-Place Concrete.”

B. Division 06 Section 06 10 00 “Rough Carpentry:” Plywood floor sheathing.

C. Division 07 - Thermal and Moisture Protection.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Verification Samples: For each finish product specified, one (1) sample, minimum size 6 inches (152 mm) square representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5-year experience manufacturing similar products.

B. Installer Qualifications: Trained journeymen with a minimum of three years successful experience in the installation of resilient flooring.

C. Regulatory Requirements: Provide slip resistant sheet vinyl safety flooring in compliance with the following:

1. Americans with Disabilities Act Architectural Guidelines (ADAAG).
2. Occupational Safety and Health Administration (OSHA).

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Store rolls of sheet goods in a secured upright position. Store materials in dry spaces protected from the weather, with ambient temperatures not less than 55 degrees F (12.8

degrees C) or more than 85 degrees F (29.4 degrees C).

C. Handle materials to avoid damage.

1.6 PROJECT CONDITIONS

A. Temperature Requirements: If storage temperature is below 65 degrees F (18 degrees C), the wall panel must be moved to a warmer place and allowed to reach this temperature before installation. For further information, refer to current Installation Guide.

B. Maintain ambient temperatures of 68 degrees F (20 degrees C) and 80 degrees F (26.7 degrees C) in spaces to receive resilient products for 72 hours before installation, during installation and 24 hours after installation.

C. Maintain the ambient relative humidity between 40 percent and 60 percent during installation.

D. Allow sufficient time for proper preparation, installation and cuing.

E. Close spaces to traffic during resilient flooring installation until the installer is satisfied the adhesive has set.

F. Verify permanent HVAC is operational. If temporary heat is required, use electric or indirect heat sources. Do not use kerosene or propane in direct contact with the ambient air.

G. Verify other finishing operations, including painting, have been completed.

H. Where demountable partitions and other items are indicated for installation on top of sheet resilient flooring material, install flooring material before these items are to be installed.

I. Coordinate with plumbing subcontractor that approved surface membrane clamping drainage connections will be used, including but not limited to, surface clamping round drains, surface clamping trench drains, surface clamping floor sinks, surface clamping grease traps, etc.

1.7 WARRANTY

A. Warranty: Provide manufacturer's standard limited warranty.

1. Basis of Design: 15-year commercial warranty minimum.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
1. Basis of Design: **Interface** or approved equal.

2.2 RESILIENT LUXURY VINYL TILE FLOORING: (LVT-1)

1. Basis of Design: **Interface – Northern Grain** or approved equal.

a. Plank Type: Standard plank.
   1) Plank Size: **25 cm x 1 m**
   2) Series and Pattern: As indicated on drawings.
   3) Color: To be selected by Architect from manufactures full line of colors.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

B. Confirm concrete slabs conform to ACI 302.1R and ACI 302.2R.

C. Perform moisture tests on concrete floors regardless of the age or grade level. Verify concrete substrate is dry in accordance with ASTM F 2170, in strict accordance with instructions.

D. Meet and prepare concrete per ASTM F 710. For other monolithic floors; ASTM F 1482 Standard for Wood Subfloors.

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 materials.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.

C. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 68 13

TILE CARPETING

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. Modular carpet tile.

1.02 REFERENCES (INDUSTRY STANDARDS)

A. American Association of Textile Chemists and Colorists (AATCC):

1. AATCC 16 – Test Method for Colorfastness to Light
2. AATCC 107 – Test Method for Colorfastness to Water
3. AATCC 129 – Test Method for Colorfastness to Ozone in the Atmosphere under High Humidity.
4. AATCC 134 – Test Method for Electrostatic Propensity of Carpets.
5. AATCC 165 – Test Method for Colorfastness to Crocking: Carpets – AATCC Crock Meter Method
6. AATCC 175 – Test Method for stain Resistance: Pile Floor Coverings

B. American Society for Testing and Materials (ASTM):

1. ASTM D418 – Methods for Testing Pile Yarn Floor Covering Construction
2. (Finished Pile Thickness only)
3. ASTM E648 – Test Method for Critical Radiant Flux of Floor Covering Systems
4. ASTM E662 – Test Method for Specific Optical Density of Smoke

C. International Standards Organization (ISO):

1. ISO 2551 – Test Method for Dimensional Stability (Aachen Test)

D. Carpet and Rug Institute (CRI):

1. CRI Indoor Air Quality Testing and Labeling Program

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation recommendations for each type of substrate.

B. Shop Drawings: Show the following:
1. Retain, delete, or revise subparagraphs below to suit Project.
2. Pattern of installation.
3. Pattern type, location, and direction.
4. Type, color, and location of insets and borders.
5. Type, color, and location of edge, transition, and other accessory strips.
6. 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 Tile: Full-size Sample.
2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch- long Samples.

D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

E. Qualification Data: For Installer.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency.

G. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
1. Methods for maintaining carpet tile, 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 tile.

H. Special Performance Requirements
1. Must have Soil and Stain Resist treatment
2. Fiber must have modified delta cross-section w/hollow core
3. Must be at least 24 dpf fiber
4. Must pass GSA requirements for permanent stain resistant carpet
5. Backing must pass British Spill Test and 10,000 Impact Test

I. Warranty: Provide manufacturer’s lifetime warranties for:
1. Wear
2. Static
3. Edge Ravel
4. Zippering
5. Delamination
6. Dimensional Stability
7. Supplemental Fiber Warranties:
   a. Lifetime Stain Warranty
   b. Lifetime Warranty against color transfer wet or dry
   c. Lifetime Warranty against wet fastness

d. 10 Year Colorfastness to Light
e. 10 Year Colorfastness to Atmospheric contaminants

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.

B. In accordance with the technical instructions in the installation instructions, use all accessories recommended by manufacturer when installing its flooring.

C. Follow the instructions specified in the most recent version of manufacturers installation instructions.

1.5 ADHESIVE

A. Manufacturer required adhesives to maintain the product warranty.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver the flooring to the installation site in manufacturers original packaging. Indicate the project name and handling instructions on the outside of the boxes.

B. Advise the carrier of any damaged material and indicate it on the packing slip.

C. Store the flooring inside, sheltered from extreme hot or cold temperatures. Place the material on a smooth level floor or where there is uniform solid support in a clean, dry well-ventilated area. Unstack the pallets. The long-term storage temperature must be maintained between 65°F (18°C) and 85°F (29°C). Protect adhesive and flooring material from freezing, extreme heat and direct sun exposure.

D. Acclimatize the subfloor, all flooring material and adhesive for 48 hours before, during and after the installation by maintaining the room temperature between 65°F (18°C) and 85°F (29°C). The pallets should be unstacked 24 hours prior to use.

E. Afterwards, maintain the room temperature between 65°F (18°C) and 85°F (29°C). Protect the material from direct sources of heat such as air vents and other types of heaters.

F. Install the flooring after all other finishing work, including painting, have been completed.

1.7 PROJECT CONDITIONS

A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."

B. Environmental Limitations: Do not install carpet tiles 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.

1.8 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.

1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, excess static discharge, and delamination.
3. Warranty Period: 10 years from date of Substantial Completion.

1.9 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 Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd..

1.10 CLOSEOUT SUBMITTALS

A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:

1. Methods for maintaining carpet tile, 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 tile.

PART 2 - PRODUCTS

2.1 CARPET TILE:

A. Basis of Design: **Interface (CPT-1)**

Style Name: Woven Gradience WG100

1. Type: Modular.
2. Size: 50 cm x 50 cm
3. Surface Texture: Textured Loop
4. Dye Method: 100% Solution Dyed
5. Series and Pattern: As indicated on drawings.
6. Color: As indicated on drawings.

B. Basis of Design: **Interface (CPT-2), (CPT-3)**

Style Name: Woven Gradience WG200

7. Type: Modular.
8. Size: 50 cm x 50 cm
9. Surface Texture: Textured Loop
10. Dye Method: 100% Solution Dyed
11. Series and Pattern: As indicated on drawings.

2.3 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives if required by manufacturer: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.

C. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the subfloor before installation to ensure that the surface is clean, dry, smooth, structurally sound and free from foreign substances that may adversely affect adhesion or cause discoloration. Furthermore, ensure that the subfloor is free of paint, varnish, adhesive, oil, grease, solvent and other foreign substances, including treatment compounds, sealers and curing compounds that may adversely affect adhesion or alter the appearance or durability the carpet tile.

B. Examine carpet tile for type, color, pattern, and potential defects.

C. Verify the surface to ensure there is no powder, scaling or mold. If there is, remove it with a mechanical sander and level with a good-quality cement-based Portland primer.

D. Slabs that have been either using a curing agent or a sealer will have to be treated to ensure that the adhesion has not been impaired.

E. Do not install on cement slabs that have been subjected to adhesive chemical abatement unless an approved remediation system was used afterwards.

F. Report and rectify all unsatisfactory conditions. Do not start flooring installation until all rectifications have been completed.

3.2 PREPARATION

A. General: Comply with the Carpet and Rug Institute's CRI 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

B. Retain or revise first paragraph below to suit product and Project; dimensions are recommended by the Carpet and Rug Institute.

C. Level all rough surfaces and fill cracks and marks with a Portland cement-based patching compound modified with latex.

D. Mechanically remove all surface contaminants such as paint, oil, grease, varnish, adhesive as well as various other products such as treatment compounds.

E. Measure the humidity and pH levels (in situations where pH testing is required) in compliance with the following standards before installation:

1. ASTM F 2170, Relative Humidity (RH) test using in situ probes.
2. ASTM F 710, pH levels (test procedure 5.3.1).
3. The ASTM test frequency recommendation is 3 measures for the first 1,000 sq. ft. (92.9 sq. m) and one measure for each additional 1,000 sq. ft. (92.9 sq. m).

F. Ensure Moisture, Relative Humidity and pH tests have all been conducted and measurements meet manufacturer's recommendations.

G. In case of doubt, test the adhesion on the cement subfloor or other surface that will be covered by the flooring. Do the test using the specified flooring and recommended adhesive.

H. Installation Method: As recommended in writing by carpet tile manufacturer.

I. Maintain dye-lot integrity. Do not mix dye lots in same area.

J. Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.

K. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

L. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

M. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.

N. Install pattern parallel to walls and borders.

O. Access Flooring: Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

3.3 CLEANING AND PROTECTION

A. Remove all excess adhesive immediately after installation as recommended in Mohawk Group's installation instructions.

B. Before allowing traffic after installation, consult and follow the recommendations in Mohawk Group's installation instructions.

C. Following installation and cleanup, if the work of all other trades has not yet been completed, protect the flooring by laying sheets of non-staining brown Kraft paper, and then a layer of plywood sheets (rolls of non-staining heavy cardboard material could also be used for protection).

D. Follow the instructions in the Manufacturers Maintenance Instructions when performing initial and regular maintenance procedures.

E. Protect carpet tile 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 tile manufacturer.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 099100 – PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes surface preparation and the application of paint systems on the following exterior substrates:

1. Concrete masonry units (CMU).
2. Gypsum Board
3. Galvanized metal
4. Aluminum (not anodized or otherwise coated).
5. Wood
6. Mechanical and electrical work (MEP)

B. Related Sections include the following:

1. Division 3 Sections “Concrete” for sealers of concrete flatwork.
2. Division 5 Sections for shop priming of metal substrates with primers specified in this Section.
3. Division 6 Sections for shop priming carpentry with primers specified in this Section.
4. Division 9 Sections for High Performance Coatings.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: Upon request, for each type of topcoat product indicated.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat indicated.

1. Submit Samples on rigid backing, 8 inches (200 mm) square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.
5. Label each sample as to date painted.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.4 QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1.5 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.

1.6 PROJECT 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 in snow, rain, fog, or mist; 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.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents. Furnish an additional 1 percent, but not less than 1 gal. of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Sherwin-Williams Company
2. Benjamin Moore & Co.
3. Duron, Inc.
4. Finnaren & Haley Inc (F&H)
5. M.A.B. Paints.
6. Porter Paints.
7. PPG Pittsburg Paints

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

Colors: Match Architect's samples

2.3 BLOCK FILLERS

A. Interior/Exterior Latex Block Filler: MPI #4.

B. Epoxy Block Filler: MPI #116.

2.4 PRIMERS/SEALERS

A. Alkali-Resistant Primer: MPI #3: Factory-formulated water based, alkali-resistant acrylic-latex interior primer for interior plaster applications

B. Exterior Primer under Acrylic Finishes: Factory-formulated acrylic-based primer for exterior application. Provide breathable primer at masonry and stucco locations.

1. Benjamin Moore; Moore's IMC Acrylic Metal Primer No. M04: Applied at a dry film thickness of not less than 2.0 mils.
2. M. A. B. Paint; Rust-O-Lastic Hydro-Prime II Acrylic (DTM) Maintenance Primer

073189: Applied at a dry film thickness of not less than 2.0 mils. C. Interior Latex

Primer/Sealer: MPI #50.

D. Interior Alkyd Primer/Sealer: MPI #45.

E. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for use in paint systems indicated.

2.5 METAL PRIMERS

A. Alkyd Anticorrosive Metal Primer: MPI #79.

B. Waterborne Galvanized-Metal Primer: MPI #134.

C. Quick-Drying Primer for Aluminum: MPI #95.

D. Rust-Inhibitive Primer (Water Based): MPI #107.

E. Vinyl Wash Primer: MPI #80.

2.6 WOOD PRIMERS

A. Exterior Latex Wood Primer: MPI #6.

B. Exterior Alkyd Wood Primer: MPI #5.

C. Interior Latex-Based Wood Primer: MPI #39.

2.7 EPOXY PAINT

A. Water-Based Epoxy (Interior and Exterior): MPI #215. A water based, two component epoxy type, semi-gloss finish coating. Subject to compliance with requirements, provide one of the following:

1. Benjamin Moore; M43/M44- 84 Acrylic Epoxy Semi-Gloss.
2. M. A. B. Paint; Ply-Tile 530 Water-Reducible Acrylic Epoxy Semi-Gloss.

B. Water-Based Epoxy (Interior and Exterior): MPI #115. A water based, two component epoxy type, Gloss finish coating. Subject to compliance with requirements, provide one of the following:

1. Benjamin Moore & Co.; Acrylic Epoxy Gloss "A", Hardener "B", M43/M44.
2. ICI Paints; Devoe Coatings, Tru Glaze WB Epoxy Gloss Coating, 4408/4418
3. Porter Paints; Dura-Glaze WB, Gloss Epoxy, 9371.
4. PPG Architectural Finishes, Inc.; Aquapon, Waterborne Epoxy, 98-1/98-98.
5. Sherwin-Williams Company (The); Industrial & Marine, Water Based Catalyzed Epoxy, B70W Series.

2.8 ALKYD PAINTS

A. Exterior Alkyd Enamel (Flat): MPI #8 (Gloss Level 1).

B. Exterior Alkyd Enamel (Semigloss): MPI #94 (Gloss Level 5).

C. Exterior Alkyd Enamel (Gloss): MPI #9 (Gloss Level 6).

D. Interior Alkyd (Flat): MPI #49 (Gloss Level 1).

E. Interior Alkyd (Eggshell): MPI #51 (Gloss Level 3).

F. Interior Alkyd (Semigloss): MPI #47 (Gloss Level 5).

G. Interior Alkyd (Gloss): MPI #48 (Gloss Level 6).

2.9 ACRYLIC-RESIN COATING.

A. Breathable cement masonry paint formulated with colorfast pigments for use over cement plaster or masonry substrates. Include manufacturer's recommended primers. Coating shall be mildew resistant and breathable with perm rating of not less than 15 per ASTM E 96.

1. Thoro Products, "Thorosheen" or equal.
2. Primer: Thoroseal 1000.
3. Texture: smooth

2.10 LATEX PAINTS

A. Interior Latex (Flat): MPI #53 (Gloss Level 1).

B. Interior Latex (Low Sheen): MPI #44 (Gloss Level 2).

C. Interior Latex (Eggshell): MPI #52 (Gloss Level 3).

D. Interior Latex (Satin): MPI #43 (Gloss Level 4).

E. Interior Latex (Semigloss): MPI #54 (Gloss Level 5).

F. Interior Latex (Gloss): MPI #114 (Gloss Level 6, except minimum gloss of 65 units at 60 deg).

G. Exterior Acrylic Latex (Flat): MPI #10 (Gloss Level 1).

H. Exterior Acrylic Latex (Semigloss): MPI #11 (Gloss Level 5).

2.11 DRY FOG/FALL COATINGS

A. Flat, Latex Dry Fog/Fall (MPI #118): Provide a water-based, emulsion-type, fast-drying coating used on overhead metal and other surfaces for application methods by airless and/or conventional spray equipment. Overspray will dry to a sweepable powder over a short distance for easier clean up.

B. Flat Dry-Fall for Galvanized Steel (water based) MPI # 133: Provide a waterborne coating, designed for direct application to cleaned, interior overhead galvanized metal surfaces, for application methods by airless and/or conventional spray equipment. Overspray will dry to a sweepable powder over a short distance for easier clean up.

2.12 Decorative Metallic Coating

A. Ready mixed oil modified synthetic resin vehicle Aluminum pigmentation: Acrylic type vehicle, non-leafing aluminum pigment, ready mixed.

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 work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMU): 12 percent.
3. Wood: 15 percent.
4. Plaster: 12 percent.
5. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates 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 plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surfaceapplied 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.

2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and re-prime substrate with compatible primers as required to produce paint systems indicated.
2. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
3. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
4. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting

D. Concrete Masonry Substrates: Remove 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. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.

F. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.

1. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3.
2. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
3. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints. H. Wood Substrates:

1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

I. Plaster Substrates: Do not begin paint application until plaster is fully cured and dry.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

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. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

F. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

G. Overhead Structure and Exposed Ceiling Steel and Galvanized-Metal Substrates:

1. Prep substrate as required minimum. Repair existing primed surfaces.
2. Galvanized surface shall be prepared by either solvent cleaning and test for chromate passivation, with an SSPC SP 7 Brush-off blast cleaning if required or chemical-etching cleaners may be substituted for solvent washing and SSPC-SP 7 cleaning.
3. Apply primer coat to unprimed surfaces.
4. Paint exposed metal deck, structural steel, conduit, un-insulated ductwork and piping, and other mechanical and electrical work in finish and occupied rooms. Protect surfaces not to be painted. Dry-Fall painting shall not be required in mechanical-electrical equipment, custodial, storage and similar rooms.

H. Exterior Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed on exterior of building, excluding roof mounted mechanical and electrical work. Items to be painted include, but are not limited to, the following:

1. Uninsulated metal and plastic piping, including hangers and supports.
2. Louvers, grilles, vents unless prefinished.
3. Mechanical equipment that is indicated to have a factory-primed finish for field painting.
4. Conduit and junction boxes.
5. Electrical equipment that is indicated to have a factory-primed finish for field painting.
6. Do not paint unless noted otherwise.
    a. Prefinished mechanical equipment and items
    b. pipe and duct insulation
    c. Prefinished electrical devices and/or cover plates
    d. Electrical fixtures
    e. Nameplaces
    f. Moving parts
7. Touch up damaged finishes, including field applied and pre-finished surfaces.

I. Interior Mechanical and Electrical Work: Unless otherwise noted, painting of mechanical and electrical work is limited to items exposed to view in finished spaces as defined herein. 1. Locations where MEP work to be field painted include following

    a. Occupied or Finish spaces are to include all rooms and other spaces with suspended, drywall or plaster ceiling, including toilet rooms and storage rooms. Also stairs, classroom and other rooms used by students
    b. Occupied or Finished Spaces with ceilings – Paint all exposed MEP work as described herein exposed to view.
    c. Occupied or Finished Spaces without ceilings - Paint all exposed MEP work as described herein exposed to view, including the structure above - unless noted otherwise.
    d. Occupied or Finished Spaces without ceilings (i.e., Egress Stairs, Gym, and Stage house), partial ceilings, and where indicated.
    e. Unless noted otherwise, painting of MEP work is not required of Unfinished or unoccupied spaces include mechanical and electrical equipment rooms (rooms whose primary purpose is to house HVAC or other MEP equipt), elevator equipment rooms, IT equipt and MDF rooms, storage rooms without finish ceilings, shafts and chases.

2. Items to be painted include, but are not limited to, the following:

    a. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
    b. Uninsulated metal and plastic piping
    c. Piping hangers and supports.
    d. Louvers grilles vents unless prefinished
    e. Mechanical equipment that is indicated to have a factory-primed finish for field painting.
    f. Electrical equipment that is indicated to have a factory-primed finish for field painting.
    g. Conduit and junction boxes, including metallic and PVC materials, fire alarm, BAS, attachments exposed and semi-exposed to view in finish areas

h. Electrical and control panels in finish areas and exposed to view

3. Do not paint, unless noted otherwise.

a. Prefinished mechanical equipment and items
b. pipe and duct insulation
c. Prefinished electrical devices and/or cover plates
d. Electrical fixtures
e. Nameplaces
f. Moving parts
g. Sight exposed interior of ductwork and other equipment

4. Touch up damaged finishes, including field applied and pre-finished surfaces.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Steel Substrates:

1. Alkyd System: MPI EXT 5.1D.

a. Prime Coat: Alkyd anticorrosive metal primer.
b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
c. Topcoat: Exterior alkyd enamel (Semi-gloss unless noted otherwise)

2. Alkyd System: MPI EXT 5.3B.

a. Prime Coat: Cementitious galvanized-metal primer.
b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
c. Topcoat: Exterior alkyd enamel (Semi-gloss unless noted otherwise)

3.6 INTERIOR PAINTING SCHEDULE A.

CMU Substrates:

1. Latex System: MPI INT 4.2A.

   a. Prime Coat: Interior/exterior latex block filler.

   b. Intermediate Coat: Interior latex matching topcoat.
   c. Topcoat: Interior latex (eggshell unless otherwise noted)

2. Water-Based Epoxy Coating System (Gloss):

   a. Block Filler: 2 coats Epoxy block filler, MPI #116.
   b. Intermediate Coat: Water-based epoxy (interior and exterior), MPI #115.
   c. Topcoat: Water-based epoxy (interior and exterior), MPI #115.

3. Water-Based Epoxy Coating System (Semi-Gloss):

   a. Block Filler: 2 coats Epoxy block filler, MPI #116.
   b. Intermediate Coat: Water-based epoxy (interior and exterior), MPI #115.
   c. Topcoat: Water-based epoxy (interior and exterior), MPI #215. B.

Steel Substrates:

1. Alkyd System: MPI INT 5.1E.

   a. Prime Coat: Quick-drying alkyd metal primer where required
   b. Intermediate Coat: Interior alkyd matching topcoat.
   c. Topcoat: Interior alkyd (Semi-gloss unless noted otherwise)

2. Water-Based Dry-Fall System: MPI INT 5.1C.

   a. Prime Coat: Quick-drying alkyd metal primer where required.
   b. Topcoat: Waterborne dry fall. C.

Galvanized-Metal Substrates:

1. Water-Based Dry-Fall System: MPI INT 5.3H.

   a. Prime Coat: Waterborne dry fall where required
   b. Topcoat: Waterborne dry fall.

2. Alkyd System: MPI INT 5.3C.

   a. Prime Coat: Cementitious galvanized-metal primer.

b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd (Semi-gloss unless noted otherwise.) D. Wood

Substrates, Traffic Surfaces:

1. Alkyd Floor Enamel System: MPI INT 6.5A.

a. Prime Coat: Exterior/interior alkyd floor enamel
b. Intermediate Coat: Exterior/interior alkyd floor enamel (gloss).
c. Topcoat: Exterior/interior alkyd floor enamel (Gloss).

E. Gypsum Board Substrates:

1. Latex System: MPI INT 9.2A.

a. Prime Coat: Interior latex primer/sealer
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex. (Refer to finish schedule for gloss level.)

END OF SECTION 099100

SECTION 10 14 23

PANEL SIGNAGE

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 room signs identifying each permanent room or space.
2. Interior informational signs.

1.3 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication and installation details for signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.

C. Sample Room Signs: Submit two full size samples of room signs illustrating type, style and color specified including method of attachment.

D. Samples for Other Signs: Submit two 12 x 12-inch size samples of each type face sheet illustrating style, texture, color, graphic image, message, cutouts and translucent lens attachment.

E. Samples Sign Frames and Trim: Submit two 12-inch-long samples of each type extruded frame and trim illustrating finish, texture, and color.

F. Sign Schedule: Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify locations of anchorage devices embedded in permanent construction by other installers by field measurements before fabrication and indicate measurements on Shop Drawings.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of finishes beyond normal weathering.
b. Deterioration of embedded graphic image colors.
c. Separation or delamination of sheet materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.2 INTERIOR ROOM SIGNS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ace Sign Systems, Inc.
2. Advance Corporation; Braille-Tac Division.
3. ASI Sign Systems, Inc.
4. InPro Corporation; SignScape Signage and Wayfinding.
5. Mohawk Sign Systems.

B. Refer to Drawings for areas requiring signage.

C. Signs: Plastic, photo-etched to produce raised text and braille; 8 x 8 inch, 1/2-inch radius corners; 1-inch high slip-in.

D. Lettering: Color and position as selected; Helvetica style, characters raised 1/32 inch.

1. Room numbers and room names 5/8-inch-high upper-case text, 1-inch high numerals.
2. Room occupant names 1/2-inch-high upper and lower case.

E. Backplate Color: Custom color to match paint sample provided by Architect. Use backing plate of matching color where mounted on glass.

F. Braille: Provide Grade 2 Braille translation of printed text.

G. Pictograms: Provide pictograms for toilet rooms and stair entry doors.

H. Provide room numbers and room names at each entrance to each room as shown on the Drawings if not indicated on Drawings as directed by Architect.

I. Mechanical Fasteners: As recommended by manufacturer. Adhesive may be used where signs are attached to glass.

2.3 INTERIOR INFORMATIONAL SIGNS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ace Sign Systems, Inc.
2. Advance Corporation; Braille-Tac Division.
3. ASI Sign Systems, Inc.
4. InPro Corporation; SignScape Signage and Wayfinding.
5. Mohawk Sign Systems.

B. Refer to Drawings for areas requiring signage.

C. Signs: Plastic subsurface printed on 1/16-inch-thick clear matte acrylic and laminated to 1/8inch-thick acrylic backplate; size required for message, 1/2-inch radius corners.

D. Lettering: Helvetica style, minimum 5/8-inch-high upper-case text. Color and position as selected.

E. Backplate Color: Custom color to match paint sample provided by Architect. Use backing plate of matching color where mounted on glass.

F. Mechanical Fasteners: As recommended by manufacturer. Adhesive may be used where signs are attached to glass.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Verify that items, including anchor inserts are sized and located to accommodate signs.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.

1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.
3. Install signs after interior surfaces are finished.
4. Locate signs as indicated on Drawings and in accordance with accessibility requirements.

B. Clean and polish signs when installation is completed.

3.3 INSTALLATION -ROOM AND INFORMATIONAL SIGNS

A. Mount room signs with mechanical fasteners as recommended by manufacturer, unless otherwise directed by Architect.

B. Locate room identification signs on wall surfaces adjacent to strike side of door, level, 5 feet above finished floor to center line of sign and 3 inches from door jamb trim.

C. Locate informational signs on wall surfaces, level, 5 feet above finished floor to center line of sign at location scheduled.

D. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.

3.4 SCHEDULE – INTERIOR SIGNAGE

A. Sign Type A:

1. Description: Acrylic sign and backplate with tactile graphics and Braille.
2. Size: 6" high x 6" wide.
3. Quantity: 13.
4. Locations: Offices, Meeting rooms

B. Sign Type B:

1. Description: Acrylic sign and backplate with tactile graphics and Braille.
2. Size: 9" high x 6" wide.
3. Quantity: 2
4. Locations: Restrooms.

C. Sign Type C: Tactile Exit Signs.

1. Description: Acrylic sign and backplate with tactile graphics and braille, one standard background and contrasting copy color stating “EXIT”:
2. Size: 9" high x 9" wide.
3. Quantity: 1.
4. Locations: Provide one area of tactile exit sign mounted on the wall adjacent to each door to an egress, exit passage, and exit discharge. In general, all exterior doors and all doors with illuminated signs shall have Type C Tactile Exit Signs adjacent to the doors as required by the International Building Code.

3.5 CLEANING AND PROTECTION

A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 10 14 23

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 102113 - PLASTIC TOILET 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 toilet compartments configured as toilet enclosures and urinal screens.

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 toilet compartments.

B. Shop Drawings: For toilet compartments.

1. Include plans, elevations, sections, details, and attachment details.
2. Show locations of cutouts for compartment-mounted toilet accessories.
3. Show locations of centerlines of toilet fixtures.
4. Show locations of floor drains.

C. Samples for Initial Selection: For each type of toilet compartment material indicated.

1. Include Samples of hardware and accessories involving 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 toilet compartments, prepared on 6inch-square Samples of same thickness and material indicated for Work.

E. Product Schedule: For toilet compartments, prepared by or under the supervision of supplier, detailing location and selected colors for toilet compartment material.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of toilet compartment.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For toilet compartments 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 and source.

1. Door Hinges: One hinge with associated fasteners.
2. Latch and Keeper: One latch and keeper with associated fasteners.
3. Door Bumper: One bumper with associated fasteners.
4. Door Pull: One door pull with associated fasteners.
5. Fasteners: Ten fasteners of each size and type.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments and urinal screens by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 75 or less.
2. Smoke-Developed Index: 450 or less.

B. Fire hazard classification: Pass NFPA 286.

C. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for toilet compartments designated as accessible.

2.2 SOLID-PLASTIC TOILET COMPARTMENTS

A. Basis of Design Product: Subject to compliance with requirements, provide Scranton Products, or comparable product by one of the following:

1. Bradley Corporation; Mills Partitions.
2. Global Partitions.

B. Toilet-Enclosure Style: Floor anchored, Overhead braced.
C. Urinal-Screen Style: Floor anchored.

D. Door, Panel, and Pilaster Construction: Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.

1. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum or stainless-steel strip fastened to exposed bottom edges of solid-plastic components to hinder malicious combustion.
2. Color and Pattern: As selected from Manufacturer’s full line product offering.

E. Pilaster Shoes: Manufacturer's standard design; stainless steel, anchored to finish floor.
F. Brackets (Fittings):

1. Stirrup Type: Ear or U-brackets, stainless steel.

2.3 HARDWARE AND ACCESSORIES

A. Hardware and Accessories: Manufacturer's heavy-duty operating hardware and accessories.

1. Hinges: Manufacturer's Stainless Steel, full height (continuous), self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees with Spring Hinge.
2. Latch and Keeper: Manufacturer's heavy-duty surface-mounted heavy aluminum extrusion (6463-T5 Alloy) latch unit designed to resist damage due to slamming, with combination rubber-faced door strike and keeper, and with provision for emergency access. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible. Mount with through-bolts.
3. Coat Hook: Manufacturer's heavy-duty combination cast-stainless-steel hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories. Mount with through-bolts.
4. Door Bumper: Manufacturer's heavy-duty rubber-tipped cast-stainless-steel bumper at out-swinging doors. Mount with through-bolts.
5. Door Pull: Manufacturer's heavy-duty cast-stainless-steel pull at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible. Mount with through-bolts.

B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.

C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless-steel, hot-dip galvanized-steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.4 MATERIALS

A. Aluminum Extrusions: ASTM B 221.

B. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.

C. Stainless-Steel Castings: ASTM A 743/A 743M.

2.5 FABRICATION

A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.

B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

C. Door Size and Swings: Unless otherwise indicated, provide 24-inch-wide, in-swinging doors for standard toilet compartments and 36-inch-wide, out-swinging doors with a minimum 32-inchwide, clear opening for compartments designated as accessible.

D. Urinal Screen Sizes: Provide panels with a minimum width of 20 inches.

E. Dividing panels shall be 55 inches high and mounted 14 inches above finish floor.

F. Doors shall be 55 inches high and mounted 14 inches above finish floor.

G. Pilasters shall be 82 inches high and fastened to stainless steel shoes with theft-proof sex bolts

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.

1. Confirm location and adequacy of blocking and supports required for installation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

1. Maximum Clearances:

a. Pilasters and Panels: 1/2 inch.
b. Panels and Walls: 1 inch.

2. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than two brackets attached near top and bottom of panel.

a. Locate wall brackets so holes for wall anchors occur in masonry or tile joints.
b. Align brackets at pilasters with brackets at walls.

B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.3 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 102800 - TOILET, BATH, AND LAUNDRY 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. Public-use washroom accessories.
2. Underlavatory guards.
3. Custodial accessories.
4. Electric hand dryer.

1.3 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

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.
2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.

B. Samples: Full size, for each exposed product and for each finish specified.

1. Approved full-size Samples will be returned and may be used in the Work.

C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify accessories using designations indicated.

1.5 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

1.7 WARRANTY

A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, visible silver spoilage defects.
2. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED MATERIALS

A. Owner-Furnished and Installed Materials:

1. Soap dispenser.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

A. Basis of Design Product: Subject to compliance with requirements, provide products by one of the following:

1. Bobrick Washroom Equipment, Inc.
2. AJW Architectural Products.
3. American Specialties, Inc.
4. Bradley Corporation.

C. Mirror: B 1658, tempered glass, channel-frame.

D. Refer to Toilet Room Equipment Schedule on Drawings for mounting heights.

2.3 UNDERLAVATORY GUARDS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Plumberex Specialty Products, Inc.
2. Truebro by IPS Corporation.

B. Under lavatory Guard:

1. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
2. Material and Finish: Antimicrobial, molded plastic, white.

2.6 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.0312-inch minimum nominal thickness, unless otherwise indicated.

B. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.0359inch minimum nominal thickness.

C. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.

D. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

E. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

F. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

G. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.7 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to method in ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 104413 - FIRE PROTECTION CABINETS

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Fire protection cabinets for the following:

a. Portable fire extinguishers.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semirecessed-, or surface-mounting method and relationships of box and trim to surrounding construction.

B. Shop Drawings: For fire-protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

C. Product Schedule: For fire-protection cabinets. Indicate whether recessed, semirecessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.6 COORDINATION

A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire protection cabinets with wall depths.

PART 2 -PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

2.2 FIRE PROTECTION CABINET

A. Cabinet Type: Suitable for fire extinguisher.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. JL Industries, Inc.; a division of the Activar Construction Products Group.
b. Larsens Manufacturing Company.
c. Potter Roemer LLC.

B. Cabinet Construction: Nonrated.

C. Cabinet Material: Cold-rolled steel sheet.

1. Shelf: Same metal and finish as cabinet.

D. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).

1. Square-Edge Trim: 1-1/4- to 1-1/2-inch backbend depth.

E. Cabinet Trim Material: Aluminum sheet.

F. Door Material: Aluminum sheet.

G. Door Style: Full acrylic bubble with frame.

H. Door Glazing: Molded acrylic bubble.

1. Acrylic Bubble Color: Clear, transparent.

I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

1. Provide projecting lever handle with cam-action latch.
2. Provide manufacturer's standard hinge permitting door to open 180 degrees.

J. Materials:

1. Cold-Rolled Steel: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
   a. Finish: Baked enamel or powder coat.
   b. Color: As selected by Architect from full range of industry colors and color densities.
2. Aluminum: ASTM B 221, with strength and durability characteristics of not less than Alloy 6063-T5 for aluminum sheet. ASTM B 221 for extruded shapes.
3. Transparent Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), with Finish 1 (smooth or polished).

2.3 FABRICATION

A. Fire Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.
2. Provide factory-drilled mounting holes.
3. Prepare doors and frames to receive locks.
4. Install door locks at factory.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
2. Fabricate door frames of one-piece construction with edges flanged.
3. Miter and weld perimeter door frames.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples

and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where recessed and semi-recessed cabinets will be installed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for recessed and semi-recessed fire protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights indicated below:

1. Fire-Protection Cabinets: 54 inches above finished floor to top of cabinet.

B. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.

1. Unless otherwise indicated, provide recessed fire protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semi-recessed fire protection cabinets.
2. Fasten mounting brackets to inside surface of fire protection cabinets, square and plumb.

C. Identification: Apply decals at locations indicated.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.

END OF SECTION

SECTION 104416 - FIRE EXTINGUISHERS

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 portable, hand-carried fire extinguishers.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to fire extinguishers including, but not limited to, the following:

a. Schedules and coordination requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher.

B. Product Schedule: For fire extinguishers. Coordinate final fire extinguisher schedule with fire protection cabinet schedule to ensure proper fit and function. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.7 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

B. Coordinate type and capacity of fire extinguishers with fire protection cabinets to ensure fit and function.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10.
b. Faulty operation of valves or release levers.

2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire protection cabinet and mounting bracket.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. J. L. Industries, Inc.
b. Larsen's Manufacturing Company.
c. Potter Roemer LLC.

2. Valves: Manufacturer's standard.
3. Handles and Levers: Manufacturer's standard.
4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.

B. Wet-Chemical Type: UL-rated 2-A:1-B:C:K, 1.6-gal. nominal capacity, with potassium acetate-based chemical in stainless-steel container; with pressure-indicating gage.

C. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 4-A:80-B:C, 10-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

2.3 MOUNTING BRACKETS

A. Mounting Brackets (Where not indicated to be in cabinets): Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with red or black baked-enamel finish.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. JL Industries, Inc.; a division of the Activar Construction Products Group.
b. Larsens Manufacturing Company.
c. Potter Roemer LLC.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

1. Mounting Brackets: 54 inches above finished floor to top of fire extinguisher.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 12 24 13 - ROLLER SHADES

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 roller shades and motorized shade operators:

1. Manually operated roller shades with single rollers.

B. Related Sections include the following:

1. Division 6 Section "Miscellaneous Carpentry" for wood blocking and grounds for mounting roller shades and accessories.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.

B. Shop Drawings: Show location and extent of roller shades. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other work, operational clearances, and relationship to adjoining work.

C. Motor Operated Shades: Include details of installation and diagrams for power, signal and control wiring.

D. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Ceiling suspension system members and attachment to building structure.
2. Ceiling-mounted or penetrating items including light fixtures, air outlets and inlets, speakers, sprinklers, recessed shades, and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.
3. Shade mounting assembly and attachment.
4. Size and location of access to shade operator and adjustable components.
5. Minimum Drawing Scale: 1/8 inch = 1 foot (1:96).

E. Samples for Initial Selection: For each colored component of each type of shade indicated.

1. Include similar samples of accessories involving color selection.

F. Samples for Verification:

1. Complete, full-size operating unit not less than 16 inches (400 mm) wide for each type of roller shade indicated.

2. For the following products:

a. Shade Material: Not less than 3 inches (76 mm) square, with specified treatments applied. Mark face of material.

b. Shade Material: Not less than 12-inch- (300-mm-) square section of fabric, from dye lot used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of material.

c. Fascia: Full-size unit, not less than 12 inches (300 mm) long.

G. Roller Shade Schedule: Use same designations indicated on Drawings.

H. Product Certificates: For each type of roller shade, signed by product manufacturer.

I. Qualification Data: For Installer.

J. Product Test Reports: For each type of roller shade.

K. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of roller shade.

L. Maintenance Data: For roller shades to include in maintenance manuals. Include the following:

1. Methods for maintaining roller shades and finishes.
2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
3. Operating hardware.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Source Limitations: Obtain roller shades through one source from a single manufacturer.

C. Fire-Test-Response Characteristics: Provide roller shade band materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. Flame-Resistance Ratings: Passes NFPA 701.

D. Product Standard: Provide roller shades complying with WCMA A 100.1.

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

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory packages, marked with manufacturer and product name, fire-test-response characteristics, lead-free designation, and location of installation using same designations indicated on Drawings and in a window treatment schedule.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Rollers Shades: Before installation begins, for each size, color, texture, and pattern indicated, full-size units equal to 5 percent of amount installed.

PART 2 - PRODUCTS

2.1 ROLLER SHADES – RS-1

A. Basis-of-Design Product: Subject to compliance with requirements, provide MechoShade Systems, Inc; Mecho/5 Shade System, Vertical Style with Snap Loc Fascia or a comparable product by one of the following:

1. Draper Inc.
2. Hunter Douglas, Inc., Contract.
3. Lutron Shading Solutions by VIMCO.

B. Shade Band Material: Woven FR Vinyl.

1. Fabric Width: As required to cover window without vertical seams.
2. Pattern: Visually transparent single-fabric shadecloth Eurotwill 6000 Series.
3. Style: Transparent Open Basket Weave.
4. Colors: To be selected from full range of standard finishes.

5. Material Openness Factor: 5 percent.
6. Bottom Hem: Straight.
7. Trim: As indicated by manufacturer's designation for style and color.

C. Rollers: Electrogalvanized or epoxy primed steel or extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with manufacturer's standard method for attaching shade material. Provide capacity for two roller shade band(s) per roller, unless otherwise indicated in a window treatment schedule.

D. Direction of Roll: Regular, from back of roller, and reverse, from front of roller, as indicated on Drawings for double-roller shades.

E. Mounting Brackets: Galvanized or zinc-plated steel.

F. Fascia: L-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; continuous panel concealing front and bottom of shade roller, brackets, and operating hardware and operators; length as indicated in a window treatment schedule; removable design for access. Surface mounted.

G. Fascia End Caps: 18” (3mm) thick sheet steel wall or jamb mounted. Material and finish to match fascia.

H. Top/Back Cover: L-shaped; material and finish to match fascia; combining with fascia and end caps to form a six-sided headbox enclosure sized to fit shade roller and operating hardware inside.

I. Pocket-Style Headbox: U-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; with a bottom cover consisting of slot opening of minimum dimension to allow lowering and raising of shade and a removable or an openable, continuous metal access panel concealing shade roller, brackets, and operating hardware and operators within.

J. Bottom Bar: Steel or extruded aluminum. Provide concealed, by pocket of shade material, internal-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.

K. Mounting: As indicated on Drawings, mounting permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.

L. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard for anchoring roller shade bottom in place and keeping shade band material taut.

M. Shade Operation: Manual; with continuous-loop bead-chain, clutch, and cord tensioner and bracket lift operator.

1. Position of Clutch Operator: Right side of roller, as determined by hand of user facing shade from inside, unless otherwise indicated in a window treatment schedule.
2. Clutch: Capacity to lift size and weight of shade; sized to fit roller or provide adaptor.
3. Lift-Assist Mechanism: Manufacturer's standard spring assist for balancing roller shade weight and lifting heavy roller shades.
4. Loop Length: Length required to make operation convenient from floor level.
5. Bead Chain: Stainless steel.
6. Operating Function: Stop and hold shade at any position in ascending or descending travel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions, and located so shade band is not closer than 2 inches (50 mm) to interior face of glass. Allow clearances for window operation hardware.

B. Connections: Connect motorized operators to building electrical system.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean roller shade surfaces after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

PART 4 - ROLLER SHADE LOCATIONS

4.1 WINDOW TREATMENT LOCATIONS

A. Provide Roller Shade RS-1 at all windows in the following rooms:

102, 103, 108, 109, 110, 111, 112, 233, 236, 237

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 12 24 13 - ROLLER SHADES

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 roller shades and motorized shade operators:

1. Manually operated roller shades with single rollers.

B. Related Sections include the following:

1. Division 6 Section "Miscellaneous Carpentry" for wood blocking and grounds for mounting roller shades and accessories.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.

B. Shop Drawings: Show location and extent of roller shades. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other work, operational clearances, and relationship to adjoining work.

C. Motor Operated Shades: Include details of installation and diagrams for power, signal and control wiring.

D. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Ceiling suspension system members and attachment to building structure.
2. Ceiling-mounted or penetrating items including light fixtures, air outlets and inlets, speakers, sprinklers, recessed shades, and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.
3. Shade mounting assembly and attachment.
4. Size and location of access to shade operator and adjustable components.
5. Minimum Drawing Scale: 1/8 inch = 1 foot (1:96).

E. Samples for Initial Selection: For each colored component of each type of shade indicated.

1. Include similar samples of accessories involving color selection.

F. Samples for Verification:

1. Complete, full-size operating unit not less than 16 inches (400 mm) wide for each type of roller shade indicated.

2. For the following products:

a. Shade Material: Not less than 3 inches (76 mm) square, with specified treatments applied. Mark face of material.

b. Shade Material: Not less than 12-inch- (300-mm-) square section of fabric, from dye lot used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of material.

c. Fascia: Full-size unit, not less than 12 inches (300 mm) long.

G. Roller Shade Schedule: Use same designations indicated on Drawings.

H. Product Certificates: For each type of roller shade, signed by product manufacturer.

I. Qualification Data: For Installer.

J. Product Test Reports: For each type of roller shade.

K. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of roller shade.

L. Maintenance Data: For roller shades to include in maintenance manuals. Include the following:

1. Methods for maintaining roller shades and finishes.
2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
3. Operating hardware.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Source Limitations: Obtain roller shades through one source from a single manufacturer.

C. Fire-Test-Response Characteristics: Provide roller shade band materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. Flame-Resistance Ratings: Passes NFPA 701.

D. Product Standard: Provide roller shades complying with WCMA A 100.1.

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

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory packages, marked with manufacturer and product name, fire-test-response characteristics, lead-free designation, and location of installation using same designations indicated on Drawings and in a window treatment schedule.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Rollers Shades: Before installation begins, for each size, color, texture, and pattern indicated, full-size units equal to 5 percent of amount installed.

PART 2 - PRODUCTS

2.1 ROLLER SHADES – RS-1

A. Basis-of-Design Product: Subject to compliance with requirements, provide MechoShade Systems, Inc; Mecho/5 Shade System, Vertical Style with Snap Loc Fascia or a comparable product by one of the following:

1. Draper Inc.
2. Hunter Douglas, Inc., Contract.
3. Lutron Shading Solutions by VIMCO.

B. Shade Band Material: Woven FR Vinyl.

1. Fabric Width: As required to cover window without vertical seams.
2. Pattern: Visually transparent single-fabric shadecloth Eurotwill 6000 Series.
3. Style: Transparent Open Basket Weave.
4. Colors: To be selected from full range of standard finishes.

5. Material Openness Factor: 5 percent.
6. Bottom Hem: Straight.
7. Trim: As indicated by manufacturer's designation for style and color.

C. Rollers: Electrogalvanized or epoxy primed steel or extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with manufacturer's standard method for attaching shade material. Provide capacity for two roller shade band(s) per roller, unless otherwise indicated in a window treatment schedule.

D. Direction of Roll: Regular, from back of roller, and reverse, from front of roller, as indicated on Drawings for double-roller shades.

E. Mounting Brackets: Galvanized or zinc-plated steel.

F. Fascia: L-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; continuous panel concealing front and bottom of shade roller, brackets, and operating hardware and operators; length as indicated in a window treatment schedule; removable design for access. Surface mounted.

G. Fascia End Caps: 18” (3mm) thick sheet steel wall or jamb mounted. Material and finish to match fascia.

H. Top/Back Cover: L-shaped; material and finish to match fascia; combining with fascia and end caps to form a six-sided headbox enclosure sized to fit shade roller and operating hardware inside.

I. Pocket-Style Headbox: U-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; with a bottom cover consisting of slot opening of minimum dimension to allow lowering and raising of shade and a removable or an openable, continuous metal access panel concealing shade roller, brackets, and operating hardware and operators within.

J. Bottom Bar: Steel or extruded aluminum. Provide concealed, by pocket of shade material, internal-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.

K. Mounting: As indicated on Drawings, mounting permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.

L. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard for anchoring roller shade bottom in place and keeping shade band material taut.

M. Shade Operation: Manual; with continuous-loop bead-chain, clutch, and cord tensioner and bracket lift operator.

1. Position of Clutch Operator: Right side of roller, as determined by hand of user facing shade from inside, unless otherwise indicated in a window treatment schedule.
2. Clutch: Capacity to lift size and weight of shade; sized to fit roller or provide adaptor.
3. Lift-Assist Mechanism: Manufacturer's standard spring assist for balancing roller shade weight and lifting heavy roller shades.
4. Loop Length: Length required to make operation convenient from floor level.
5. Bead Chain: Stainless steel.
6. Operating Function: Stop and hold shade at any position in ascending or descending travel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions, and located so shade band is not closer than 2 inches (50 mm) to interior face of glass. Allow clearances for window operation hardware.

B. Connections: Connect motorized operators to building electrical system.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean roller shade surfaces after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

PART 4 - ROLLER SHADE LOCATIONS

4.1 WINDOW TREATMENT LOCATIONS

A. Provide Roller Shade RS-1 at all windows in the following rooms:

102, 103, 109, 110, 111, 112

END OF SECTION 12 24 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 12 32 00 - MODULAR CASEWORK

PART 1 – PRODUCTS

1.40 RELATED DOCUMENTS

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

1.41 SUMMARY

A. This Section includes the following:

1. Fixed modular laminate clad casework filler panels, and components.
2. Work Room cabinets and casework 3. Reception desks
4. Countertops.
5. Accessories.
6. Shelving.
7. Stainless steel base
8. Stainless steel supports

B. Related Sections include the following:

1. Division 6 Section “Miscellaneous Carpentry" for wood blocking for anchoring casework.
2. Division 9 Section "Resilient Wall Base and Accessories" for resilient base applied to plasticlaminate casework.
3. Division 22 Sections for installing plumbing and fixtures in casework.

1.42 DEFINITIONS

A. Identification of casework components and related products by surface visibility.

1. Open Interiors: Any open storage unit without solid door or drawer fronts and units with full glass insert doors and/or acrylic doors.
2. Closed Interiors: Any closed storage unit behind solid door or drawer fronts, sliding solid doors.
3. Exposed Ends: Any storage unit exterior side surface that is visible after installation.
4. Other Exposed Surfaces: Faces of doors and drawers when closed, and tops of cabinets less than 78 inches above furnished floor.
5. Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 78 inches or more above finished floor.

6. Concealed Surfaces: Any surface not visible after installation.

1.4 QUALITY ASSURANCE

A. Manufacturer/Fabricator: Minimum of 10 years' experience in providing manufactured casework systems for similar types of projects, produce evidence of financial stability, bonding capacity, and adequate facilities and personnel required to perform on this project.

1.5 SUBMITTALS

A. Product Data:

1. Panel products, high-pressure decorative laminate, solid-surfacing material, including cabinet hardware and accessories, and finishing materials and processes.

B. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.

1. Include section drawings of typical and special casework, work surfaces and accessories. Details for Stainless steel wrapped wood base
2. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, and other items installed in architectural woodwork.
3. Indicate locations of plumbing and electrical service field connection by others.
4. Include details of utility spaces showing supports for conduits and piping.
5. Include details of exposed conduits, if required, for service fittings.
6. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
7. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.

1.6 DELIVERY, STORAGE, & PRODUCT HANDLING

A. Completed laminate clad casework, countertops, and related products are to be delivered to project site only after wet operations in building are completed, store in ventilated place, protected from the weather, with relative humidity range of 25 percent to 55 percent.

B. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

1.7 COORDINATION

A. Coordinate delivery, layout, rough-in and installation for support of modular casework.

B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that casework can be supported and installed as indicated.

C. Coordinate installation of modular casework with installation of plumbing, electrical, and mechanical equipment.

D. The casework contractor shall verify all critical building dimensions prior to fabrication of casework. The casework manufacturer shall re-configure the casework arrangement to dimensions requiring 2-1/2" of less of filler at each end of wall-to-wall elevations and to ensure a complete and satisfactory installation.

E. Obtain template for sinks, faucets, electrical devices and other fixtures and devices mounted in casework and countertops for other contractors and installers.

1.8 JOB CONDITIONS

A. Environmental Requirements: Do not install casework until permanent HVAC systems are operating and temperature and humidity have been stabilized for at least 1 week.

1. Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.
2. After installation, control temperature and humidity to maintain relative humidity between 25 percent and 55 percent.

B. Conditions: Do not install casework until interior concrete work, masonry, plastering and other wet operations are complete.

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

1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 WARRANTY

A. All materials and workmanship covered by this section will carry a five (5) year warranty from date of acceptance & a ten (10) year warranty for instrument storage units, unless otherwise noted.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Core Materials:

1. Particleboard up to 7/8 inch thick: Industrial Grade average 47-pound density particleboard, ANSI A 208.1-1999, M-3. made with binder containing no urea formaldehyde.
2. Particleboard 1 inch thick and thicker: Industrial Grade average 45-pound density particleboard, ANSI A 208.1-1999, M-2. made with binder containing no urea formaldehyde.
3. Medium Density Fiberboard 1/4 inch thick: Average 54-pound density grade, ANSI A208.2. made with binder containing no urea formaldehyde.
4. Hardwood Plywood: HPVA HP-1, either veneer core or particleboard core, unless otherwise indicated made with binder containing no urea formaldehyde.
5. Moisture resistant particleboard up to 1 inch thick: Industrial Grade average 45-pound density particleboard, ANSI A 208.1-1999, M-3 made with binder containing no urea formaldehyde.
6. All hardboard shall be tempered with a S2S surface finish and must meet or exceed the hardboard product standard ANSI-A135.5.
7. Exterior grade resins.
8. Casework and work surface core panel materials to be made of engineered board that:

    a. Meets ANSI 208.1 M2 PB specifications
    b. Uses formaldehyde-free, exterior-grade polyurethane resin (NAF)
    c. Has VOC emission factors that are less than 0.01 ppm
    d. Core Material at Sinks: exterior-grade plywood or exterior grade MDF.

B. Decorative Laminates:

1. Standards NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard:

    a. High-pressure decorative laminate VGS (.028), NEMA Test LD 3-2000.
    b. High-pressure decorative laminate HGS (.048), NEMA Test LD 3-2000.
    c. High-pressure decorative laminate HGP (.039), NEMA Test LD 3-2000.
    d. High-pressure cabinet liner CLS (.020), NEMA Test LD 3-2000.
    e. High-pressure backer BKH (.048), (.039), (.028), NEMA Test LD3-2000.
    f. Thermally fused melamine laminate, NEMA Test LD 3-2000. Color as selected by Architect

2. Manufacturer: Subject to compliance with requirements, provide Wilsonart International; Div. of Premark International, Inc. high-pressure decorative laminates by one of the following:

    a. Pionite
    b. Formica Corporation.
    c. Nevamar Company, LLC; Decorative Products Div.
    d. Laminart

2.2 PLASTIC LAMINATE-FACED CABINETS

A. Design: Flush Overlay

B. Exposed Materials:

2. Plastic Laminate: Grade VGS.

a. Unless otherwise indicated, provide specified edgebanding on all exposed edges

3. Solid Wood: Clear hardwood lumber of species indicated, selected for compatible grain and color.

C. Semi-exposed Materials:

1. Plastic Laminate: Grade VGS unless otherwise indicated. Provide plastic laminate for semi-exposed surfaces unless otherwise indicated.

a. Provide plastic laminate of same grade as exposed surfaces for interior faces of doors and drawer fronts and other locations where opposite side of component is exposed.

2. Thermoset Decorative Panels: Provide thermoset decorative panels for semi-exposed surfaces unless otherwise indicated.

b. Provide plastic laminate of same grade as exposed surfaces for interior faces of doors and drawer fronts and other locations where opposite side of component is exposed.

3. Hardboard: Use only for cabinet backs where exterior side of back is not exposed.
4. Metal for Steel Drawer Pans: Cold-rolled, carbon-steel sheet complying with ASTM A 1008/A 1008M; matte finish; suitable for exposed applications.
5. Unless otherwise indicated, provide specified edgebanding on all semi-exposed edges. B.

Concealed Materials:

1. Solid Wood: Any hardwood or softwood species, with no defects affecting strength or utility.
2. Plywood: Hardwood plywood.
3. Plastic Laminate: Grade BKL.
4. Particleboard.
5. MDF.
6. Hardboard.

C. Edging Materials:

1. 1 mm PVC banding at body front edge, interior components and shelves.
2. 3 mm PVC banding, machine profiled to 1/8-inch radius at door and drawer fronts, and countertops.
3. As selected from manufacturer’s standard colors. Architect will select a color to coordinate with final selection of each cabinet body and countertop laminate.

2.3 CABINET HARDWARE

A. Hinges:

1. Frameless concealed Hinges (European Type): BHMA A156.9, Type B01602, 170 degrees of opening, self-closing. Provide two hinges for doors less than 48 inches (1220 mm) high, and provide three hinges for doors more than 48 inches (1220 mm) high.

B. Pulls:

1. Door and drawer front pulls are stainless steel wire type, 96mm spacing on screws. Pull design shall comply with the Americans with Disability Act (ADA) but not less than 4" centers. Install with "tamperproof" screws.

C. Drawer Slides:

1. Regular knee space and pencil: 100-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature. Paper storage, full extension 150-pound load rated epoxy coated steel slides.
2. File: Full extension, 150-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions D. Adjustable Shelf Supports:

1. Injection molded transparent polycarbonate friction fit into cabinet end panels and vertical dividers, adjustable on 32mm centers. Each shelf support has 2 integral support pins, 5mm diameter, to interface pre-drilled holes, and to prevent accidental rotation of support. The support automatically adapts to 3/4 inch or 1 inch thick shelving and provides non-tip feature for shelving. Supports may be field fixed if desired. Structural load to 1200 pounds (300 pounds per support) without failure.

E. Locks:

1. All drawers and doors shall be lockable.
2. Removable core, disc tumbler, cam style lock with strike. Lock for sliding 3/4-inch-thick doors is a disc type plunger lock, sliding door type with strike. Lock for sliding glass/acrylic doors is a ratchet type sliding showcase lock. Dull chrome finish.
3. Elbow catch or chain bolt used to secure inactive door on all locked cabinets.
4. Key all locks in each room the same unless noted otherwise. Master key all cabinets locks

F. File Suspension System: Extruded molding integral with top of drawer box sides to accept standard hanging file folders.

G. Support Members: Counter Top and Work Top Support Brackets: Preformed heavy duty prefinished steel brackets TMI Systems Design Corp Model A7455 or approved equal. Color as selected by Architect. Spacing as indicated but not to exceed 48 inches.

H. Hardware Finishes:

1. For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated. BHMA 630: Satin Stainless Steel (US32D)

2. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.91

2.4 SPECIALTY ITEMS

A. Grommets for Cable Passage through Countertops: 2 ½ inch OD, color to be selected, moldedplastic grommets and matching plastic caps with slot for wire passage. Provide Doug Mockett & Company, Inc., Model # PS-2B-26D or approve equal.

2.5 SOLID SURFACE COUNTERTOPS:

A. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2.

1. Manufacturers: Subject to compliance with requirements, provide Corian or comparable products by one of the following as selected by architect:

a. Avonite, Inc.
b. Formica Corporation.
c. Nevamar Company, LLC; Decorative Products Div.
d. Swan Corporation (The).
e. Wilsonart International; Div. of Premark International, Inc.

2. Colors and Patterns:

a. SS-1: Deep Space
b. SS-2: Silver Birch

2.6 FABRICATION:

A. Fabricate casework, countertops and related products to dimensions, profiles, and details shown.

B. All casework panel components to be finished precisely to size and squareness within 0.01 inches utilizing a sizing process to ensure strict dimensional quality and structural integrity in the final fabricated product.

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

1. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial

fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.

2. hop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
3. Seal edges of openings in countertops with a coat of varnish.
4. Install glass to comply with applicable requirements in Division 8 Section "Glazing" and in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

D. Laminate Cabinet Body Construction:

1. Tops and bottoms are glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals. Minimum 6 dowels each joint for 24 inch deep cabinets and a minimum of 4 dowels each joint for 12 inch deep cabinets.

   a. Tops, bottoms and sides of all cabinets are 3/4 inch particleboard core.

2. Cabinet backs: 1/2 inch thick particleboard core.

   a. Exposed back on fixed or movable cabinets: 3/4 inch thick particleboard with the exterior surface finished in VGS laminate as selected.

3. Fixed base and tall units have an individual factory-applied base, constructed of 3/4 inch thick exterior grade plywood. Base is nominal 4 inch high unless otherwise indicated on the drawings.
4. Base units, except sink base units: Full sub-top. Sink base units are provided with open top and a stretcher at the front, attached to the sides. Back to be split removable access panel.
5. Side panels and vertical dividers shall receive adjustable shelf hardware at 32mm line boring centers. Mount door hinges, drawer slides and pull-out shelves in the line boring for consistent alignment.
6. Exposed and semi exposed edges: High Pressure Decorative Laminate.
7. Adjustable shelf core: 3/4 inch thick particleboard up to 36 inches wide, 1 inch thick particleboard over 36 inches wide. Shelves in open cabinets, regardless of width, shall be 1 inch thick particleboard.

   a. Front edge: 1 mm PVC banding.

8. Interior finish, units with open Interiors:

   a. Top, bottom, sides, horizontal and vertical members, and adjustable shelving faces with thermally fused high-pressure decorative laminate with matching prefinished back.

9. Interior finish, units with closed Interiors:

   a. Top, bottom, sides, horizontal and vertical members, and adjustable shelving faces with thermally fused melamine laminate with matching prefinished back.

10. Exposed ends:

    a. Faced with VGS high-pressure decorative laminate.

11. Wall unit bottom:

    a. Faced with thermally fused melamine laminate.

12. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), are not permitted.

F. Plastic-Laminate-Faced Cabinet Construction: As required by referenced quality standard, but not less than the following:

1. Bottoms and Ends of Cabinets, and Tops of Wall Cabinets and Tall Cabinets: 3/4-inch particleboard.
2. Shelves: 3/4-inch thick particleboard.
3. Backs of Cabinets: 1/2-inch- thick particleboard or MDF where exposed, 1/4-inch hardboard dadoed into sides, bottoms, and tops where not exposed.
4. Drawer Fronts: 3/4-inch particleboard.
5. Filler Strips: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinets.

G. Drawers:

1. Sides, back and sub front: Minimum 1/2 inch thick particleboard, laminated with thermally fused melamine doweled and glued into sides. Top edge banded with 1 mm PVC.
2. Drawer bottom: Minimum 1/2 inch thick particleboard laminated with thermally fused melamine, screwed directly to the bottom edges of drawer box.

H. Door/Drawer Fronts:

1. Core: 3/4 inch thick particleboard. Door and drawer fronts shall be overlay door design.
2. Provide double doors in opening in excess of 24 inches wide.
3. Laminate Exterior: VGS High-pressure decorative laminate.
4. Interior: High-pressure cabinet liner CLS.
5. Door/drawer edges: 1 mm PVC.

I. Shelving:

1. Core material: 3/4 inch or 1 inch thick particleboard.
3. Exterior: Thermally fused melamine laminate,.
4. Edges: 1 mm PVC banding, all 4 edges.

J. Stainless Steel counter supports

1. Fabricate to dimensions and shapes on drawings
2. Grind all sharp edges to minimal radius
3. Nonwelded Connections: Use mechanical joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings.

PART 3- EXECUTION

3.1 INSPECTION:

A. Installer shall examine the substrates and supporting structure and the conditions under which the casework is to be installed, including compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of laboratory casework.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION:

A. Condition casework to average prevailing humidity conditions in installation areas prior to start of installation.

3.3 INSTALLATION:

A. Install level, pump, and true; shim as required, using concealed shims. Where laminate clad casework abuts other finished work, including but not limited to pipes, ducts, and column enclosures, scribe and cut to accurate fit. Install to tolerance of 1/8 inch in 96 inches for plumb and level. Install adjoining trim with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.

B. Securely attach carpentry work to substrate and supporting members using fasteners of size that will not penetrate members where opposite side will be exposed to view or receive finish materials.
Install fasteners without splitting wood; fasten panel products to allow for expansion at joints unless otherwise indicated.

C. Fit carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction. Install wood trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Install trim after gypsum board joint finishing operations are completed.

D. Countersink nail heads on exposed carpentry work and fill holes with wood filler.

3.4 INSTALLATION OF CABINETS

A. Base Cabinets: Adjust top rails and subtops within 1/16 inch of a single plane. Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions with fasteners spaced not more than 24 inches o.c. Fasten adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch.

1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches (600 mm) o.c. and at sides of cabinets with not less than 2 fasteners per side.

B. Wall Cabinets: Adjust fronts and bottoms within 1/16 inch of a single plane. Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 24 inches o.c. Align similar adjoining doors to a tolerance of 1/16 inch.

C. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.

D. Adjust casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

3.5 INSTALLATION OF COUNTERTOPS

A. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints only where shown on Shop Drawings.

B. Field Jointing: Where possible, make in the same manner as shop jointing using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop.

1. Use concealed clamping devices for field joints in plastic-laminate countertops. Locate clamping devices within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten according to manufacturer's written instructions to exert a uniform heavy pressure at joints. C. Fastening:

1. Secure countertops, except for epoxy countertops, to cabinets with z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
2. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.

D. Provide required holes and cutouts for fixtures and fittings.

E. Seal unfinished edges and cutouts in plastic-laminate countertops with a heavy coat of polyurethane varnish.

F. Provide scribe moldings for closures at junctures of countertop, curb, and splash, with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.

G. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.6 INSTALLATION OF SINKS

A. Semiflush Installation of Stainless-Steel Sinks: Before setting, apply sink and countertop manufacturers' recommended sealant under rim lip and along top. Remove excess sealant while still wet and finish joint for neat appearance.

3.7 CLEANING AND ADJUSTMENT:

A. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.

B. Repair minor damage per plastic laminate manufacturer’s recommendations.

C. Remove and dispose of all packing materials and related construction debris.

D. Clean cabinets inside and out. Wipe off fingerprints, pencil marks, and surface soil etc., in preparation for final cleaning by the building owner.

END OF SECTION 123200

SECTION 12 36 61

QUARTZ AGGLOMERATE COUNTERTOPS

PART 1 - GENERAL

1.01 SUMMARY

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

1.02 THIS SECTION INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING HORIZONTAL AND TRIM QUARTZ SURFACING PRODUCT TYPES:

1. Countertops
2. Countertops with drop-in sinks
3. Bar tops

1.03 RELATED REQUIREMENTS

A. Division 06 Section 06 10 53 “Miscellaneous Rough Carpentry.”

B. Section 07 92 00 “Joint Sealants.”

C. Section 26 27 26 “Wiring Devices.”

1.04 REFERENCES

A. CSA B45/IAPMO ANSI Z124 (previously ANSI Z124.6 – Plastic Sinks).

1. CSA B45/IAPMO ANSI Z124 Section 5.7.1.3 – Point Impact tests.

B. ASTM C170 – Standard Test Method for Compressive Strength of Dimension Stone.

C. ASTM C370 – Standard Test Method for Moisture Expansion of Fired Whiteware Products.

D. ASTM C373 – Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products, Ceramic Tiles, and Glass Tiles.

E. ASTM C501 – Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.

F. ASTM C1026 – Standard Test Method for Measuring the Resistance of Ceramic Tile to Freeze-Thaw Cycling.

G. ASTM C1028 – Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.

H. ASTM D570 – Standard Test Method for Water Absorption of Plastics.

I. Star-K Kosher Certification (www.star-k.org).

1.05 SUBMITTALS

A. Submit product data for each type of product indicated.

1. Submit manufacturer's product data on material characteristics, performance properties, fabrication instructions, installation instructions and maintenance instructions.

B. Shop drawings:

1. Show location of each item; provide complete detailed and dimensioned plans and elevations, large-scale details, attachment devices and other components.

a. Show the following:

1) Full-size details, edge details, attachments, etc.
2) Locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.
3) Fabrication details for brackets.
4) Locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacle and other items installed in quartz surface.
5) Locations and sizes of cutouts for sink installation and lavatory installation.
6) Type of sealant.
7) Type of adhesive.
8) Seam locations.

C. Samples:

1. For each type of product indicated:

a. Submit minimum 2-inch-by-2-inch sample in specified color. For viewing pattern or veining, submit minimum 4-inch-by-4-inch samples.
b. Cut sample and seam together for representation of seaming techniques.
c. Indicate full range of color and pattern variation.
d. Approved samples will be retained as a standard for work.

D. Product data:

1. Indicate product description, fabrication information and compliance with specified performance requirements.

E. Fabricator/installer qualifications:

1. Provide copy of certification number.

F. Certificates: Certify that products meet or exceed requirements.

1. UL Environment– GREENGUARD and GREENGUARD Gold, current low emitting VOC certification of quartz surface and solid surface products.
2. UL Environment– GREENGUARD and GREENGUARD Gold, current low emitting VOC certification for manufacturer's recommended adhesive and/or sealant.
3. UL Environment – Mold Resistance Certification in accordance with UL 2824.

G. Fire test response characteristics:

1. United States – Provide Class A surface burning characteristics as determined by testing products per UL 723 (ASTM E 84, NFPA 255) or another testing and inspecting agency acceptable to authorities having jurisdiction.

a. Flame Spread Index: 25 or less.
b. Smoke Developed Index: 450 or less.

2. Canada – Provide with surface burning characteristics as determined by testing products by UL Canada per ULC S102 or another testing and inspecting agency acceptable to authorities having jurisdiction.

H. Maintenance data:

1. Submit manufacturer's care and maintenance data.
2. Include in project closeout documents.

1.06 QUALITY ASSURANCE

A. Qualifications:

a. Shop employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance.

B. Fabricator/installer qualifications:

1. Work of this section shall be by a certified fabricator/installer, certified in writing by the manufacturer or designated representative.

C. Allowable tolerances:

1. Variation in component size: ±1/8 inch (3 mm) over a 10 foot length.
2. Location of openings: ±1/8 inch (3 mm) from indicated location.
3. Minimum of 1/16 inch and a maximum of 1/8 inch (3 mm) clearance between quartz surfaces and each wall.

D. Coordination drawings:

1. Shall be prepared indicating:

a. Plumbing work.
b. Electrical work.
c. Miscellaneous steel for the general work.
d. Indicate location of all walls (rated and non-rated), blocking locations and recessed wall items, etc.

2. Content:

a. Project-specific information, drawn accurately to scale.
b. Do not base coordination drawings on reproductions of the contract documents or standard printed data.
c. Indicate dimensions shown on the contract drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements.
d. Provide alternate sketches to designer for resolution of such conflicts.

1) Minor dimension changes and difficult installations will not be considered changes to the contract.

3. Drawings shall:

a. Be produced in 1/2 inch scale for all fabricated items.

4. Drawings must be complete and submitted to the architect within 60 days after award of contract for record only.

a. No review or approval will be forthcoming.
b. Coordination drawings are required for the benefit of contractor's fabricators/installers as an aid to coordination of their work to eliminate or reduce conflicts that may arise during the installation of their work.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver no components to project site until areas are ready for installation.

B. Store components indoors in clean and dry area prior to installation.

C. Handle materials to prevent damage to finished surfaces.

D. Follow manufacturer's safe handling and storage recommendations.

E. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.08 WARRANTY

A. Provide manufacturer's 10-year warranty.

B. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

1.09 MAINTENANCE

A. Provide maintenance requirements as specified by the manufacturer.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Contract Documents are based on products manufactured by **Corian® Quartz (Basis of Design)** subject to compliance with the requirements, Or Approved Equal.

a. Address: Corian® Design, Corian® Quartz, Chestnut Run Plaza 735, 974 Centre Road, P.O. Box 2915, Wilmington, DE 19805.
b. Phone: (800) 426-7426.
c. Website: www.surfaces.dupont.com; www.corianquartz.com.

B. Substitutions: Not permitted.

2.02 MATERIALS

A. Material:

1. **Basis of Design; Corian® Quartz (or approved equal)** material composed of ~93 % natural quartz with pigments and resin.
2. Material shall have minimum physical and performance properties as specified.

B. Thickness: **As indicated on drawings**

C. Edge treatment:

1. Appliance Edge.

a. Finished.

D. Seam width:

1. 1/16 inch nominal unless otherwise specified.

E. Sink mounting:

1. Drop in.

F. Backsplash:

1. None

G. Endsplash:

1. None

H. Corian® Quartz Performance Properties (TYPICAL RESULTS):

1.	Flexural Strength	> 5,300 psi	ASTM D790
2.	Flexural Modulus	5.3–5.7 X 106 psi	ASTM D790
3.	Compression Strength (Dry)	27,300 psi	ASTM C170
4.	Compression Strength (Wet)	24,400 psi	ASTM C170
5.	Hardness	7	Mohs Hardness Scale
6.	Thermal Expansion	1.45 x 10-5 meter/meter deg C	ASTM D696
7.	Thermal Expansion	2.61 x 10-5 inch/inch deg F	ASTM D696
8.	Colorfastness	Passes	NEMA LD 3-3.3

9.	Gloss (60° Gardner)	45–50	ANSI Z124
10.	Wear and Cleanability	Passes	CSA B45.5-11/IAPMO Z124-2011
11.	Stain Resistance	Passes	CSA B45.5-11/IAPMO Z124-2011
12.	Fungal Resistance	No observed growth on product	ASTM G 21
13.	Bacterial Resistance	No observed growth on product	ASTM G 22
14.	High Temperature Resistance	None to slight effect	NEMA LD 3-3.6
	a. Temperature, 356 deg F		
15.	Boiling Water Resistance	None to slight effect	NEMA LD 3-3.5
16.	Freeze-Thaw Cycling	Unaffected	ASTM C1026
17.	Point Impact	Passes	ANSI Z124.6.4.2
18.	Ball Impact Resistance	No failure at 164 inches	NEMA LD 3-3.8
	a. Slabs, No fracture,1/2 lb. ball – 2cm and 3 cm		
19.	Static Coefficient of Friction	0.89 (Dry), 0.61 (Wet)	ASTM C1028
20.	Abrasion Resistance	139	ASTM C501
21.	Density	2.4 g/cm3	ASTM D792
22.	Water Absorption, Long-term	0.12%	ASTM C373
23.	Water Absorption, Short	< 0.04%	ASTM C373
24.	Moisture Expansion	< 0.01% average	ASTM C370
25.	Flammability	Class A, all colors	NFPA 101® Life Safety Code
26.	Flame Spread Index	FSI 0 for 3 cm	UL 723
27.	Flame Spread Index	FSI ≤ 5 for 2 cm	UL 723
28.	Smoke Developed Index	SDI ≤ 40 for 3 cm	UL 723
29.	Smoke Developed Index	SDI ≤ 75 for 2 cm	UL 723
30.	Flame Spread Value	0 for 3 cm	CAN/ULC-S102
31.	Flame Spread Value	5 for 2 cm	CAN/ULC-S102
32.	Smoke Developed Value	10 for 3 cm	CAN/ULC-S102
33.	Smoke Developed Value	50 for 2 cm	CAN/ULC S102
34.	Nominal Thickness	2 cm and 3 cm	
35.	Nominal Weight per square foot for 2cm thickness is 10 pounds		
36.	Nominal Weight per square foot for 3cm thickness is 15 pounds		

I. CORIAN® QUARTZ (ZODIAQ®) CERTIFICATIONS and APPROVALS:

1. New York City Material Equipment Acceptance Number for DuPont™ Zodiaq® is 431-00-M.
2. NSF/ANSI Standard 51, Listed by NSF.
3. UL Environment/GREENGUARD Certified.
4. UL Environment/GREENGUARD Gold Certified.
5. UL 2824 - Mold Resistant.
6. Kosher, Listed by Star-K.

2.03 ACCESSORY PRODUCTS

A. Mounting Adhesives:

1. 100 percent Silicone Sealant.

B. Seam Adhesive:

1. Corian® Joint Adhesive to create color-coordinated seam.

C. Sink/bowl mounting hardware:

1. Manufacturer's approved sink setters, bowl clips and fasteners for attachment of undermount sinks/bowls.

2.04 FABRICATION

A. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.
B. Form joints between components using manufacturer's standard joint adhesive.

a. Reinforce as required.

2. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
3. Rout and finish component edges with clean, sharp returns.
4. Rout cutouts, radii and contours to template.

C. Smooth edges.

2.05 FINISHES

A. As Selected by Architect from the manufacturer's standard color chart.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General

1. Install countertop materials in accordance with manufacturer's instructions.
2. Structural Support:
   a. Provide MDF or moisture resistant plywood structural support as required by manufacturers fabrication/installation fundamentals literature.
3. Additional weight from attached sink or lavatory will affect maneuverability of tops during transportation and installation.
4. Carefully plan work to avoid damaging finished tops during transportation and installation.

B. Install components plumb and level, in accordance with approved shop drawings and product installation details.

1. Tops:

a. Flat and true to within 1/8 inch (3 mm) of a flat surface over a 10-foot length.
b. Allow a minimum of 1/16 inch to a maximum of 1/8 inch (3 mm) clearance between surface and each wall.
c. Form field joints using manufacturer's recommended adhesive (Corian® Joint Adhesive), with joint widths no greater than 1/8 inch (3 mm) in finished work.
d. Keep components and hands clean when making joints.

C. Sinks/Lavatory Bowls:

1. Adhere undermount sinks/lavatory bowls to countertops using manufacturer's recommended adhesive and mounting hardware.

2. Adhere drop-in sinks/bowls to countertops using silicone sealant and manufacturer-recommended adhesives.

D. Provide backsplashes and endsplashes only if indicated on the drawings.

1. Adhere to countertops using silicone sealant.

a. Keep components and hands clean when working with silicone sealant.

3.02 CONNECTIONS:

A. Make plumbing connections in accordance with Division 22.

B. Make electrical connections in accordance with Division 26.

3.03 CLEANING AND PROTECTION

A. Keep components and hands clean during installation.

B. Remove adhesives, sealants and other stains in accordance with manufacturer's instructions.

1. Clean exposed surfaces in accordance with manufacturer's instructions.
2. Components shall be clean on date of substantial completion.

a. Protect surfaces from damage until date of substantial completion.

3. Replace or repair damaged work in a satisfactory manner.

3.04 SCHEDULE

A. Countertops:

1. Location: As shown on drawings.

END OF SECTION

TABLE OF CONTENTS

DIVISION 22 – PLUMBING

22 00 00 General Provisions – Plumbing

22 00 10 Basic Materials and Methods – Plumbing

22 00 30 Insulation & Covering – Plumbing

22 01 10 Drainage Systems – Plumbing

22 01 20 Domestic Water Systems – Plumbing

22 01 90 Testing – Plumbing

DIVISION 23 – HVAC

23 02 00 General Provisions – HVAC

23 02 10 Basic Materials and Methods – HVAC

23 02 15 Valves

23 02 30 Insulation & Covering – HVAC

23 04 50 Refrigeration Equipment – HVAC

23 06 00 Air Distribution & Accessories – HVAC

23 07 60 Air Handling Equipment

23 09 00 Automatic Temperature Controls (DDC)

23 09 50 Testing & Balancing of Mechanical Systems

DIVISION 26 – ELECTRICAL

26 00 00 General Provisions – Electrical

26 00 55 Electrical Identification

26 01 10 Raceways

26 01 20 Wires and Cables

26 01 21 Wire Connections and Devices

26 01 35 Electrical Boxes & Fittings

26 01 40 Wiring Devices

26 01 70 Motor and Circuit Disconnects

26 01 80 Overcurrent Protective Devices

26 01 90 Supporting Devices

26 04 72 Branch Circuits

26 05 10 Building Lighting

26 07 40 Network Cabling Systems

END OF SECTION

SECTION 22 00 00

GENERAL PROVISIONS - PLUMBING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to work of this Section.

B. This specification or drawing and the design features or resulting construction disclosed, are the property of Furlow Associates, Inc., and shall not be reproduced without written permission.

1.2 WORK INCLUDED

A. Provide labor, materials, equipment and supervision necessary to install complete operating Plumbing Systems as indicated the drawings and specified herein, including all work at the site and within the proposed construction areas to accomplish the required work.

1.3 REGULATIONS, CODES AND STANDARDS

A. Work shall be performed in accordance with latest adopted codes, regulations and ordinances by authorities having jurisdiction. Observe all safety regulations.

B. Latest editions of any referenced standards shall govern.

C. Obtain all municipal and/or the Authorities Having Jurisdiction permits and inspection certificates and pay all charges.

D. Make or arrange for any/or all inspection agency reviews or visits and pay all charges. This includes communication with each respective agency and/or utility to verify the project system work, coordination responsibilities, fees, back charges, etc., required.

E. All fees and back charges shall be verified during the bidding phase of the work. Any discrepancy of this item between any utility, inspection agency and the Contractor shall be brought to the attention of the A/E prior to bid opening.

F. Submission of a bid will be deemed evidence of having complied with these requirements.

1.4 RELATED WORK

A. Refer to equipment shown or specified in sections of Division 1 thru 14 and 26 that will require Plumbing services.

B. Refer to work related to Plumbing as shown on the following contract drawings:

Architectural & Structural

HVAC

Electrical

1.5 COORDINATION

A. The Mechanical, Plumbing and Electrical Contractors are responsible to coordinate all manufacturer's recommended circuit breakers, starters, disconnects and fuse sizes for all equipment. Submission of a shop drawing will certify that this has been completed. Any necessary changes required will be included as part of this contract.

B. Plumbing Contractors shall coordinate scheduling, submittals and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of independent work elements, with provisions to accommodate items that may be installed at a later time.

C. Plumbing Contractors shall verify utility requirements and all characteristics of operating equipment are compatible with the building utilities. Coordinate the work of all sections related and required for installing, connection and placing in service of all equipment.

D. Plumbing Contractors shall coordinate all space requirements, supports and installation of all mechanical, electrical, plumbing and fire protection work, which are indicated diagrammatically on the Drawings. Verify routing of all pipes, ducts, conduits and equipment connections. Maximize accessibility for other work, and service requirements for maintenance and repairs.

E. Obtain written confirmation from all related trade Contractors and the Owner or his representative that requirements, conflicts and coordination issues have been discussed and resolved.

1.6 SUBMITTALS

A. Shop Drawings & Product Data:

1. Shop drawings and product data shall be submitted in accordance with Division 1 of these specifications except where herein modified.

NOTE: Submittals will only be reviewed once and resubmittals will be reviewed once. Any other submittals will be billed to the Contractor at the Engineer's standard rates.

2. Listed are the required shop drawings and reports required for this project. The Engineer/Owner shall reserve the right to require additional submissions not listed below:

- All fixtures, equipment and associated devices so listed on the Fixture Schedule on the drawings.
- Insulation
- All specified piping systems.
- All specified valves.
- Hanger and supports including Sumner system.
- Piping labels and identification.
- Testing reports.

- Sterilization report.

- Operating/Maintenance manuals.

- As-Built Drawings.

3. Submittals comprising complete catalog cuts, shop drawings and performance test data for Plumbing materials and equipment as required by other sections of Division 22, shall be submitted for review checking. The Contractor shall review these for conformance to contract documents prior to submission and affix contractor's signature to each submittal certifying that this review has been done. By approving and submitting shop drawings, product data, samples and similar materials, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction data that relates to the work, and has checked and coordinated this information with all of the requirements contained in the contract documents for the work of all trades.

   a. The Contractor an equipment manufacturer shall clearly identify in all submittals and shop drawings any and all applications standards which require additional work to accommodate this equipment and provide a complete and operational system as described in the contract documents.

   b. The Contractor shall be completely responsible for any and all additional costs associated with the changes required by this and all other trades.

4. All submittals shall have the following identification data, as applicable, contained therein or permanently adhered thereto.

   a. Project name.

   b. Project number.

   c. Sub-contractor's, vendor's and/or manufacturer's name and address.

   d. Product identification.

   e. Identification of deviation from contract documents.

   f. Applicable contract drawings and specification section number.

   g. Shop drawing title, drawing number, revision number, and date of drawing and revision.

   h. Resubmit revised or additional submittals as requested.

   i. Wherever shop drawings or vendor's standard data sheets indicate work to be done "by others", it shall be the responsibility of the contractor making the submission to identify by name, the contractor who is to do this work. If the contractor named is other than the contractor making the submission, the shop drawing submission must be reviewed by the named contractor and bear his mark of approval, prior to submission to the Architect/Engineer.

j. Where equipment proposed differs from that shown on the drawings or specified, he shall submit for approval drawings showing the manner in which the layout is affected by the substitution.

k. The Contractor shall keep one copy of approved shop drawings at the job site,, filed in a suitable metal container. The shop drawings shall be cataloged and kept in good repair, and shall be available for use by the Owner, Architect and Engineer.

l. No equipment shall be ordered, fabricated, etc., before approval of shop drawings.

B. Contractor is responsible for the shop drawing coordination and interface with the work of other contracts and adjacent work. The relationship of Contractor's work shall be verified as it relates to adjacent and critical features of the work of this and all contracts and materials.

1.7 WARRANTY/GUARANTEE

A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, GENERAL REQUIREMENTS. In addition, refer to specifications for special guarantees.

B. Wherever in the specification sections of this division, reference is made to a specific warranty period, this warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the contract documents.

1.8 SITE INSPECTION

A. The Contractor shall visit the site, inspect, and become aware of all conditions which may affect the work during the estimation phase of his work and prior to bid openings. Investigate utilities, protection requirements for adjacent facilities, storage locations, and access to the construction area.

B. Submission of a bid will be deemed evidence of having complied with this requirement.

1.9 SUBSTITUTIONS

A. Whenever a material, article, piece of equipment or system is identified in the following specification or indicated on the drawings by reference to manufacturers' or vendors' names, trade names, catalog numbers or the like, it is so identified for the purpose of establishing the basis of the Bid.

B. Substitution approval must be obtained and included as an addendum item prior to the submission of the bid. An approved substitution shall not be considered as an approval for the Contractor or an equipment vender to deviate from the written portion of the specifications unless so stated in the addendum.

C. The drawings illustrate the space allocated for equipment and the Contractor shall install the equipment accordingly. If changes are required in the building or arrangement due to substitution of equipment, the Contractor making the substitution must pay for the necessary modifications.

D. The listed equivalent or substituted manufacturers along with the bidding related contractor shall be completely responsible to comply with all requirements as indicated on all contract documents and as described within the specifications. This shall include, but shall not be limited to space requirements, code clearances, the type, horsepower, capacities, number and size of services required from other trades, including all required ancillary items furnished and installed by other trades. If the

manufacturer or related bidding contractor does not comply with these requirements, then they shall be responsible for any and all additional costs associated with the changes required by other trades.

1.10 LUBRICATION

A. Furnish, install and maintain all required lubrication of any equipment operated prior to acceptance by the Owner. Lubrication shall be as recommended by the equipment manufacturer.

B. Provide one year's supply of lubricants to Owner at date of acceptance.

C. Verify that required lubrication has taken place prior to any equipment start-up.

1.11 EQUIPMENT START-UP

A. Verify proper installation by manufacturer or his representative.

B. Advise General Contractor 2 days prior to actual start-up.

C. Verify proper operation. Obtain signed statement by manufacturer or his representative that equipment is operating within warranty requirements. Submit statement to General Contractor.

1.12 OPERATION & MAINTENANCE INSTRUCTIONS

A. Properly and fully instruct Owner's personnel in the operation and maintenance of all systems and equipment.

B. Ensure that the Owner's personnel are familiar with all operations to carry on required activities.

C. Such instruction shall be for each item of equipment and each system as a whole.

D. Provide report that instruction has taken place. Include in the report the equipment and/or systems instructed, date, contractor, Owner's personnel, vendor, and that a complete operating and maintenance manual has been reviewed.

E. Manual shall include all instructions on operation, maintenance, repair parts list, lubrication requirements, brochures, catalogue cuts, wiring diagrams, piping diagrams, control sequences, service requirements, names and addresses of vendors, suppliers and emergency contacts. Three manuals shall be provided.

F. Submit manuals for review prior to operating instruction period. Manuals shall be 8-1/2 x 11" with hard cover, suitably bound.

G. Provide to the Owner any special tools necessary for operation and routine maintenance of any of the equipment.

1.13 TOOLS

A. All equipment furnished by the Contractor which requires special tools or devices other than those normally available to the maintenance or operating staff shall be furnished in duplicate to the Owner, sufficiently marked, packed or boxed for staff usage. The tools provided shall be listed by the Contractor identified as to their use or the equipment applicable in a written transmittal to the Owner.

1.14 CLEANING AND FINISHING

A. After equipment start-up and all operating tests have been made and the system pronounced satisfactory, each respective Contractor shall go over the entire project, clean all equipment, etc., installed by him and leave in a clean and working condition. Any surfaces found marred after this final cleaning shall be refinished or replaced by each Contractor at no cost to the Owner.

B. Provide for the safety and good condition of all materials and equipment until final acceptance by the Owner. Protect all materials and equipment from damage. Provide adequate and proper storage facilities during the progress of the work. Special care shall be taken to provide protection for bearings, open connections, pipe coils, pumps, compressors and similar equipment.

C. All NEW fixtures, piping, finished surfaces and equipment installed shall have all grease, adhesive labels and foreign materials removed.

D. All new piping installed shall be drained and flushed to remove grease and foreign matter. Pressure regulating assemblies, traps, flush valves and similar items shall be thoroughly cleaned. Remove and thoroughly clean and reinstall all liquid strainer screens after the system has been in operation ten (10) days.

E. Gas piping shall be blown out with clean compressed air or inert gas.

F. When connections are made to existing systems, the Contractor shall do all cleaning and purging of the existing systems required to restore them to the condition existing prior to the start of work.

G. Clean-up: Remove from the premises, all unused material and debris resulting from the performance of work under this section.

PART 2 – PRODUCTS

2.1 GENERAL

A. All material and equipment shall be new and of present day manufacture, and shall conform to accepted standards of the trade where such a standard has been established for the particular type of equipment or material.

B. Whenever equipment or material is referred to in the singular, such as "the plumbing fixture", it shall be deemed to apply to as many such items as necessary to complete the work.

2.2 PRODUCT DELIVERY, STORAGE AND HANDLING

A. During loading, transporting and unloading exercise care to prevent damage to material.

B. Store all materials in dry enclosures or under protective coverings out of way of work progress.

C. Material shall not be allowed to be stored directly on ground.

D. Deliver in manufacturer's original cartons or on skids.

E. Handle and protect so as to prevent damage to product or any surrounding material.

2.3 CONCRETE

A. Concrete, if used on this project, shall be in accordance with Section 03300.

B. The 28-day minimum compressive strength shall be 3000 psi.

PART 3 – EXECUTION

3.1 PROTECTION

A. Plug or cap open ends of piping systems.

B. Stored materials shall be covered to prevent damage by inclement weather, sun, dust or moisture.

C. Protect all installed work until accepted in place by the Owner.

D. Plates, polished metal escutcheons and other finished devices shall not be installed until masonry, tile, and painting operations are complete unless otherwise protected.

E. Protect all work from operations which may cause damage such as hauling, welding, soldering, painting, insulating and covering.

F. Do not remove protective material until equipment is placed in service.

3.2 WORKMANSHIP

A. Install all work neat, trim and plumb with building lines.

B. Install work in spaces allocated.

C. Cutting and patching shall be performed by skilled tradesmen normally employed for the work involved.

3.3 EXCAVATION

A. The excavation shall be of the open-trench method and to the depths and widths as may be necessary. The Contractor shall do all excavation required in connection with his work. Bottoms of trenches shall be excavated to a uniform grade. All materials excavated shall be deposited on the side of the trenches and beyond the reach of the slides. Excavated material shall not be piled where it will interfere with traffic. If rock is encountered, it shall be removed by the General Contractor. See provisions in Division 2.

B. No piping shall be bedded directly on rock. They shall be cushioned by a 6-inch layer of crushed stone or gravel of selected grade, of size to pass through 3/4" mesh sieve. Not less than 30% shall be fine which will pass through a 3/8" mesh sieve.

3.4 SHORING AND PUMPING

A. The Contractor shall provide all shoring, bracing or sheet piling necessary to maintain the banks of his excavation and shall take out same as the work progresses and filling in has been accomplished. Shoring shall be in accordance with OSHA Standards.

B. The arrangement of shoring must be such as to prevent any movement of the trench banks and consequent strains on the conduits. Shoring shall be provided to prevent damage to work installed by other trades.

C. The Contractor shall do all pumping required to keep his excavations free of water. The water shall be conveyed in piping or watertight troughs a sufficient distance that it will flow from the site and not affect other work being performed.

3.5 BACKFILLING

A. After work in trenches has been completed, they shall be filled with select fill in 8" layers and shall be pneumatically tamped before the next layer of material has been filled in. The backfill shall be free of excavated rock, cinders, stones, brickbats or other debris.

B. Wherever rock is removed, the Contractor shall secure and fill select clean earth to a minimum depth of 3'-0" above the top of the pipe. Unless otherwise indicated, no rock shall be deposited in the trench fill. This clean earth fill shall be procured other than from the site unless permission for earthborrow from the site is granted by the Architect. If site borrow is permitted, the topsoil removal, relocation and finished grading will be accomplished as directed by the Architect.

C. Under no circumstances shall excavated material be left where it will interfere with the Owner's or other Contractor's operations.

D. All earth and other materials taken from the trenches and not required for backfilling shall be deposited where directed, or removed from the premises as directed by the Architect.

E. Any rock removed from the excavation shall be removed from the project site by the Contractor.

F. Trenches which pass under wall footings or within 18" of column footings shall be backfilled with lean concrete. To secure adequate foundation support, the method and depositing of the concrete fill shall be as directed by the Architect. To prevent the concrete from adhering to the pipes, necessary pipe protection shall be applied.

3.6 EQUIPMENT SETTING

A. Furnish and install as a minimum, a 4-inch concrete pad beneath all floor-mounted equipment. Install anchor bolts in pour.

B. Furnish and install as a minimum, spring vibration isolation under any equipment 10 HP and over and rubber in shear vibration isolation on any equipment up to 10 HP.

C. Concrete shall be 3,000 psi, 28-day compressive strength in accordance with ACI-613. Reinforce with No. 4 rod 12" on centers both ways or as otherwise detailed.

3.7 FASTENERS, HANGERS AND SUPPORTS

A. Furnish and install all hangers and supports required to suspend, mount, or hang the work.

B. Furnish and install all miscellaneous steel angles, channels, beams, clips, brackets and anchors necessary to hang or support the work. Provide submissions for review.

C. Install concrete inserts before concrete is poured.

D. Drilled inserts shall not be loaded more than 1/4 rated capacity or 200 pounds.

E. Power-driven fasteners shall not be allowed for piping larger than 2 inches, or equipment. When used they shall not be loaded more than 1/8 rated capacity or 200 pounds.

F. All hangers, miscellaneous steel, braces and supports shall be galvanized, cadmium plated, or primed steel. Copper tubing shall be supported with copper hangers. No direct contact of dissimilar metals between the piping system and its hanger support shall be permitted.

G. Piping shall be supported from adjustable clevis type hangers with insulation pipe saddles. Where hangers are 18" or longer, provide lateral bracing at every fourth hanger. See IPC Pipe Support Table below:

PIPE SUPPORT SPACING

Material	Horizontal Max. Feet	Vertical Max. Feet
ABS Pipe	4	10
Aluminum	10	15
Brass	10	10
Brass Tube up to 1-1/4"	6	10
Brass Tube over 1-1/2"	10	10
Cast Iron	5	15
Copper up to 1-1/4"	6	10
Copper over 1-1/4"	10	10
CPVC Up to 1"	3	10
CPVC Over 1"	4	10
Lead Pipe	Continuous	4
PB Pipe/Tubing	2.6 ft. (32")	10
PVC Pipe	4	10
PEX	2.6 ft. (32")	10
Steel Tubing	8	10
Steel Pipe	12	15

H. Support vertical piping at floor levels using approved riser clamps. Clamp material shall be compatible with pipe material. Maximum vertical spacing shall be 10'-0".

3.8 SLEEVES

A. Provide each pipe passing through a masonry or concrete wall, floor or partition with a sleeve made from standard weight steel pipe for pipe with smooth edges, securely and neatly cemented in place. Provide each pipe passing through a frame or metal partition with a sleeve made from No. 22 gauge galvanized sheet metal, securely fastened in place.

B. Pipe passing through foundation wall or under foundation shall be provided with relieving arch or steel pipe per IPC Section 305.5.

C. Be responsible for the proper location and alignment of all sleeves.

D. Provide hydrostatic seals for sleeves passing through outside walls, below grade, or through hydrostatically sealed slabs or floors on grade. Provide fire-rated seals for all other sleeves.

E. Install both piping and sleeve seals so as to maintain integrity of seals with expansion and contraction of piping.

F. Set floor sleeves flush with floor surface in finished areas, 1" above the finished floor in kitchens, cafeterias, and similar service areas unless such areas are slab-on-grade; 1" above the floor in mechanical rooms, pipe chases, pipe spaces and other unfinished areas, unless otherwise indicated, and flush with the underside of slabs. Extend wall and partition sleeves through and cut flush with each surface unless otherwise indicated or specified.

G. Select sleeves two pipe sizes larger than any pipe that is to remain uncovered, unless otherwise required by the sealing method specified. Where pipes are to be covered, provide sleeves large enough to allow the covering to pass through the sleeves with sufficient clearance for sealing as specified hereinafter. Size sleeves for branch piping from vertical risers large enough to permit vertical expansion at the riser.

H. Place sleeves imbedded in concrete floors or walls in the forms before concrete is poured; sleeves shall have integral waterstop flanges, where they are to receive either watertight or hydrostatic seals.

I. Install sleeves passing through above-grade floors of mechanical rooms, toilet rooms, kitchens or similar service areas where liquid leaks or spillover may occur in a watertight manner. Sleeves shall be such that waterproofing membrane can be flashed around and into the sleeve where necessary.

J. Seal sleeves for pipes passing through ceiling air plenum walls or the floor above air tight in a manner similar to that specified for fire-rated sleeves.

K. Hydrostatic Sealing Method: Provide compressible synthetic rubber seals, equivalent to LINK SEAL, manufactured by the Thunderline Corporation, or THRUWALL manufactured by O.Z. Gedney. Install seals in accordance with the manufacturer's recommendations to provide air tightness aboveground and hydrostatic sealing belowgrade. Caulking or other type mastic is not acceptable.

L. Fire-Rated Sealing Method:

1. Sleeves, openings and sealants shall comply with applicable codes, recommended practices and standards, and manufacturer's instructions. Fire sealants shall have ability to prevent spread of flame, smoke or water throughout the penetration and shall pass 3 hour test, UL test ASTM E814 and UL 1479.

2. Products: Chase Corporation CTC PR-855, O. Z. Gedney CRS/CAFS, 3M Electro-Products Division Putty 303 or Caulk CP25 penetration sealing kits, General Electric Company sealants type RTV-850, 6428 or 7403, Thunderline Corporation "Link-Seal Pyro-Pak". Installation and type of sealant to be used as recommended by the manufacturer.

3. Expansion collars, fire seal/firestop collars – ASTM E814 (UL1479). Spec Seal Corporation, Inc. (plastic pipe).

3.9 PLATES

A. Furnish and install chrome plated plates wherever piping passes into finished area.

B. Plates shall be securely fastened to piping or building construction.

C. Floor plates shall cover 1 inch sleeve extension.

3.10 OFFSETS, TRANSITIONS, MODIFICATIONS

A. Furnish and install all offsets necessary to install the work and to provide clearance for other trades.

B. Maintain adequate headroom and clearance.

C. Incidental modifications necessary to the installation of the systems shall be made as necessary and as approved by the Architect.

3.11 RECESSES

A. Furnish information to the General Contractor as to sizes and locations of recesses required to install panels, boxes, and other equipment or devices which are to be recessed in walls.

B. Make offsets or modifications as required to suit final locations.

3.12 LABELING

A. All Plumbing equipment such as pumps, and devices requiring identification for operating procedures shall be provided with permanent black laminated micarta white core labels with 3/8 inch letters.

B. This shall also apply to all controllers, remote start/stop pushbuttons and equipment cabinets.

3.13 FLASHING AND COUNTERFLASHING

A. Roof drains, vents, roof curbs, etc., shall have counterflashing fittings. General Contractor shall provide flashing.

B. Piping and conduit thru the roof shall be flashed by the General Contractor. Furnish and install counterflashing.

3.14 ACCESS

A. Locate all equipment, valves, devices and controllers which may need service in accessible places.

B. Where access is not available, access panels shall be provided. Furnish access doors to the General Contractor for installation.

C. Access doors shall be Elmdor, Karp Co., MIFAB or Controlled Air Manufacturing Limited, with 16 gauge frames and 14 gauge steel door, prime painted.

D. Maintain required access clearances.

3.15 WIRING

A. Packaged plumbing system equipment shall be furnished with disconnect switches, and magnetic starters, factory furnished and wired by the unit manufacturer.

B. All control wiring shall be furnished and installed under this Division of the work.

C. All wiring shall be in accordance with the National Electrical Code and as recommended by the equipment manufacturer.

3.16 UTILITIES

A. Do not interrupt any utility or service to the Owner without adequate previous notice and schedule.

B. Arrange and pay for the relocation, disconnection or removal of, or relocate, disconnect or remove existing utilities and services where such work is shown or where such utilities or services interfere with new construction, whether or not shown. Provide all excavation, backfilling and paving required by such work.

C. Perform alteration of utilities and services in accordance with the rules, regulations and requirements of the involved utility companies, regulatory agencies having jurisdiction.

3.17 CUTTING AND PATCHING EXTERIOR SURFACES

A. This Contractor shall be responsible for returning disturbed paved and/or grass areas to original condition where excavation for utilities has been required.

B. Cut and patch paved areas to match original surface.

C. Properly tamp backfill before finishing or repairing disturbed area surfaces.

3.18 OPENINGS - CUTTING, REPAIRING

A. This contractor shall cooperate with the work to be done under other sections in providing information as to openings required in walls, slabs and footings for all piping and equipment, including sleeves where required.

B. Any drilling or cutting required for the performance of work under this Section, shall be the responsibility of this Contractor and the cost thereof shall be borne by him.

C. Holes in Concrete: Sleeves shall be furnished, accurately located and installed in forms before pouring of concrete. This contractor shall pay all additional costs for cutting of holes as the result of the incorrect location of sleeves. All holes through existing concrete shall be either core drill or saw cut. All holes required shall have the approval of the Structural Engineer prior to cutting or drilling.

D. It shall be the responsibility of this Contractor to ascertain that all chases and openings are properly located.

3.19 GUARANTEE

A. All materials and equipment provided and/or installed under this section of the specifications shall be guaranteed for a period of two years from the date of acceptance of the work by the Owner unless otherwise specified in Division 1. Should any trouble develop during this period due to defective materials or faulty workmanship, the Contractor shall furnish all necessary labor and materials to correct the trouble without any cost to the Owner. Any defective materials or inferior workmanship noticed at time of installation and/or during the guarantee period shall be corrected immediately to the entire satisfaction of the Owner.

In the event of occupancy by the Owner prior to final acceptance of the project, the guarantee date for equipment placed in operation shall be mutually agreed to by the Contractor and the Owner's representative.

3.20 DRAWINGS

A. The Plumbing Systems are indicated on the Contract Drawings. Certain pertinent information and details required by the Plumbing Work appear on the Architectural, Structural and Electrical Drawings; become familiar with all Drawings; and incorporate all pertinent requirements.

B. Drawings are diagrammatic and indicate the general arrangement of systems and requirements of the Work. Do not scale Drawings. Exact locations of fixtures and equipment, not specifically shown shall be obtained before starting work.

C. When indicated on the drawings, plumbing riser diagrams are completely diagrammatic and indicate the intent of the work for both the Contractor, L&I review agencies and/or Authorities Having Jurisdiction. Where valves, shock absorbers, incidental equipment, devices, etc., including execution notes are indicated on the riser diagrams, they shall be so required and installed as part of the system work.

3.21 RECORD DRAWINGS

A. As-Built record drawings, showing dimensions, locations, and depth of all buried and concealed piping, plugged outlets and equipment shall be kept up to date. Master copy shall be kept on the job. No backfilling of trenches shall be permitted until as-built drawings are approved as up-to-date by the Owner/Representative. No plumbing progress payments shall be approved unless as-built drawings are up- to-date. Depth of sewers shall be from a permanent bench mark as shown on the contract drawings. Refer to project record drawings under General Conditions.

END OF SECTION 22 00 00

SECTION 22 00 10

BASIC MATERIALS AND METHODS - PLUMBING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the work specified in this Section.

1.2 REFERENCE

A. Install all piping, fixtures, equipment, etc., to meet the requirements of the following:

New Castle County Department of License and Inspection

New Castle County Department of Sewers

Delaware State Plumbing Code

Delaware State Fire Marshal's Office

International Plumbing Code (All applicable sections)

International Mechanical Code (All applicable sections)

NFPA

OSHA

All requirements of the above governing agencies shall be in compliance with the latest issues, rules or regulations in effect.

B. Appliances and materials governed by UL requirements shall meet such requirements and bear the label.

1.3 QUALITY ASSURANCE

A. Provide adequate supervision of labor force to assure all aspects of specifications are being fulfilled.

B. Insure that all work and equipment is installed in accordance with manufacturer's warranty requirements.

C. Replace all pipes and fittings shown to be defective as a result of testing.

1.4 SUBMITTALS

A. Submit shop drawings and product data in accordance with Section 220000.

B. Submit the following:

1. Manufacturer's Product Data on all pipe and fittings to be used in project.

2. Manufacturer's Product Data on all valves to be used in project.

1.5 WARRANTY/GUARANTEE

A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, GENERAL REQUIREMENTS.

PART 2 – PRODUCTS

2.1 STEEL PIPE & FITTINGS

A. Pipe: ASTM A-53, Schedule 40.

B. Fittings:

1. Cast iron, threaded, 175 psi, ANSI B-16.4.

2. Malleable iron, threaded, ASA B 16.3.

3. Steel, socket weld, ASTM A-53.

4. Wrought iron, socket weld, ASTM A-72.

C. Thread tape shall be teflon tape, 3 mils minimum thickness. Teflon tape shall not be permitted for use on gas piping systems.

D. See Section 220130 for Gas Piping Systems.

2.2 CAST IRON PIPE AND FITTINGS

(Note: Any cast iron piping made or marked “CHINA” will NOT be acceptable on this project)

A. Aboveground (Contractor’s Option):

1. Pipe & Fittings: Hubless cast iron, CISPI 301, ASTM A-74 and ASTM A-888 shall be marked with the collective trademark of the Cast Iron Institute (soil pipe).

2. Joints: Neoprene sleeve and stainless steel shield and clamp assembly, CISPI 310, ASTM-1277.

3. PVC DWV Pipe and Fittings: Schedule 40, ASTM D-2665, D2949, F891, and CSA B181.2

B. Below grade and/or slab: (Contractor's Option)

1. Bell and Spigot: Service weight bell and spigot pattern ASTM-74 with compression type neoprene gaskets ASTM C-564.

2. Hubless: Hubless cast iron pipe CISPI 301, with heavy duty 3.04.016 stainless steel bands for below-grade installation. Elastomeric seal component ASTM C-564 and CSA B-602.

3. Hubless Joints: Cast iron CISPI 310 and as TM C-1277.

4. PVC DWV pipe and fittings, Schedule 40, ASTM D-2665, D2949, F891 and CSA B181.2.

5. Corrosion protection shall be in accordance with IPC 305.1. Provide appropriate wrapping or sheathing when pipe is exposed to lime and acid of concrete, cinder or other corrosive materials.

6. Protection of all below-grade storm and sanitary shall be in accordance with IPC Section 305.

C. Corrosion protection shall be in accordance with IPC 305.1. Provide appropriate wrapping or sheathing when piping is exposed to lime and acid of concrete, cinder or other corrosive materials.

2.3 COPPER TUBING

A. Domestic hot, cold and recirculated water:

1. Aboveground:

a. Tubing: Hard-drawn, seamless ASTM B-88, Type "L".

b. Fittings: Solder joint wrought copper ANSI B-16.22.

c. Joints: Lead-free solder 410°, ASTM B-32 alloy designation “TC”, ASTM B-828.

d. Flux: Non-toxic and non-corrosive, ASTM B-813.

2. Underground:

a. Tubing: Soft-drawn, seamless ASTM B-88, Type "K".

b. Fittings: Solder joint wrought copper ANSI B-16.22.

c. Joints: Lead-free solder 410°, ASTM B-32, ASTM B-828.

d. Flux: Non-toxic and non-corrosive, ASTM B-813.

B. Drainage and vent piping:

1. Aboveground:

a. Tubing: Hard-drawn seamless ASTM B-88, ASTM B-75, Type "M" and DWV as pipe size permits.

b. Fittings: Solder joint cast copper drainage type ANSI B-16.29.

c. Joints: Soldered, 95/5 tin-antimony ASTM B-828, ASTM B-32.

d. Flux: Non-toxic and non-corrosive, ASTM B-813.

C. Solder/Flux: See Paragraph 3.4 of this section for Soldering/Brazing.

2.4 VALVES (Copper Systems) – Solder ends of Threaded

A. Valves listed below shall be for domestic water systems and comply with the latest requirements of

NSF 61-8. Refer to individual sections for gas valves.

B. Ball Valves: NIBCO two-piece, full port, 600 psi WOG rated, cold non-shock valve with reinforced TFE seals, 316 stainless steel ball, Eco-brass body, ASTM 584, Alloy C87850, solder ends, or threaded non-blowout stem design. Acceptable NIBCO figure numbers: T/S 685-80-66-LF; T/S 595-Y-66-LF (3 piece).

C. Check Valves: NIBCO Class 125, Eco-brass body, ASTM 584, Alloy C87850, swing type, Y Pattern, threaded cap access. Acceptable NIBCO figure number: T/S 413-LF. (NIBCO figure number T/S-413-B for condensate drainage.)

D. Gate Valves: NIBCO Class 125, Eco-Brass body, ASTM 584, Alloy C87850, Rising Stem. Acceptable NIBCO figure number: T/S 113-LF.

E. Balance Valves: All balance valves shall be provided with a memory stop feature with calibrated name plate to assure specific valve setting. Bronze body/brass ball, carbon filled TFE seat rings. NIBCO, Bell & Gosset, Accu-Flow, Taco or Flow Design "Accusetter". Acceptable NIBCO figure numbers: T/S 1710, F/G 737.

F. Strainers:

1. Class 125 Bronze Y-Strainer, body to be ASTM B584 or B62 bronze with threaded, solder or female press end connections and .033 inch perforated type 304 stainless steel screen or 20 mesh type 304 stainless steel screen accessible without removing the strainer from the line. Acceptable Figure numbers: NIBCO Fig. S/T-221, S/T-222, PF-221/222-A,B.

2. Class 125 Flanged Cast Iron Y-Strainer, body to be ASTM A-126 Class B cast iron. End connections to be Class 125 flanged, tapped bolted bonnet with plug. Screen shall be .033 inch perforated type 304 stainless steel screen or 20 mesh type 304 stainless steel screen accessible without removing the strainer from the line. Acceptable Figure numbers: NIBCO Fig. F 721-A.

3. Class 250 Threaded Cast Iron Y-Strainer: Strainer body to be ASTM A-126 Class B cast iron. End connections to be Class 250 threaded, tapped screw-in bonnet with plug. Screen shall be .033 inch perforated type 304 stainless steel screen or 20 mesh type 304 stainless steel screen accessible without removing the strainer from the line. Acceptable Figure numbers: NIBCO Fig. T-751-A

G. VALVES (Copper Systems) – Press Fit

1. Valves listed below shall be for domestic water systems and comply with the latest requirements of NSF-61-8.

a. 2 Inch and Smaller Ball Valves (On/Off):

Ball Valves with male or female press to connect shall be rated at 200 PSI CWP to +225°F maximum. Valves shall be manufactured in accordance with MSS SP-110 and constructed of dezincification resistant cast bronze bodies. Brass with more than 15% zinc shall not be approved. Valve shall have reinforced PTFE Seats, Blow-out Proof Stem, Full Port Ball, Chrome/Nickel Plated or Stainless Steel Ball for aggressive water.

b. 2 Inch and Smaller Check Valves (Swing Type):

Check valves shall be swing type Y pattern with male or female press to connect ends and shall be rated 200 PSI CWP to + 250°F maximum. Valves shall be manufactured in accordance with MSS SP-80. Body & cap shall be manufactured of dezincification resistant cast bronze ASTM B62 or ASTM B584 Alloy C8440. Valves shall have PTFE seat disc.

c. 2 Inch and Smaller Check Valves (Lift or Spring Type):

Incline resilient disc, spring actuated, 250psi rating, non-shock cold working pressure, 2500F maximum working temperature, bronze ASTM B584 alloy C84400. Stainless steel stem and disc holder and spring, EDPM O-ring.

H. Insofar as possible, all valves of the same type shall be of the same manufacturer.

I. Valve Manufacturers: Subject to compliance with requirements, provide valves of one of the following:

Apollo/Conbraco

Stockham

Nibco

Milwaukee

Watts

Hammond

Webstone

J. System Application:

1. Domestic Water:

a. Check Valves - 2" & Smaller - threaded or soldered.

b. Ball Valves - 3" & Smaller - threaded or soldered.

c. Balance Valves - All sizes - threaded.

d. Butterfly Valves - 4" and larger - flanged.

e. Butterfly Valves – 3” and smaller – wafer type.

2.5 ISOLATING FITTINGS

A. Furnish isolating fittings between all sections of dissimilar piping materials or piping, general supports, equipment and supports, including piping hanger and rack supports where one material is ferrous and the other is non-ferrous.

B. Install copper or brass piping or tubing in such a way as not to touch or come in contact with ferrous metals.

C. Where ferrous piping or equipment is connected to copper or brass piping, make connection with insulating or dielectric unions to prevent electrolytic action between the ferrous and non-ferrous metals.

D. Where copper or brass piping, tubing or fittings are anchored to, supported by or may come in contact with ferrous metal construction, provide an insulating nonconductor spacer of rubber, fiber or equivalent material to assure prevention of electrolysis.

E. Manufacturer: Epco Sales, Inc., or insulated unions by Central Plastic Co.

2.6 ANCHORS AND GUIDES

A. Anchors and guides shall be provided to support and maintain pipes in position and properly distribute expansion. The anchors and guides must be securely fastened to the building structure, and must be completely installed before the system is tested.

B. Guides shall be as manufactured by J.J. McNally, Inc., Flexonics, Inc., Tube-Turns, American District Steam Co.

2.7 UNIONS

A. Up to and including 2 inch pipe size: Screwed pattern, bronze-to- bronze seat.

B. Above 2 inch pipe size: 125 Class Flanged pattern, A.S.A. sweat copper fitting, with gaskets, bolts and nuts.

C. Copper tubing unions shall have sweated type ends. Flanged unions on copper tubing may be soldered connections.

D. Materials and pressure ratings shall be the same as specified for the respective pipe and fitting system unless otherwise specified.

PART 3 – EXECUTION

3.1 PIPING SYSTEM INSTALLATION REQUIREMENTS

A. Drawings are generally diagrammatic and due to small scale, it is impossible to indicate all fittings, valves, gauges and specialties required. Provide complete operating systems and all necessary fittings, valves gauges and specialties whether or not indicated.

B. Install all piping in accordance with the best practices of the trade and latest code requirements. Use uniform system materials throughout the building. All branch take-offs shall be off the top of the pipe.

C. Pipe and fittings shall be clean from cutting burrs, foreign materials and defects in structure and threading. Make all cuts square. Ream after cutting. Clean off scale and dirt inside and outside, before assembly. Remove welding slag or other foreign material.

D. Keep all piping as high as possible, consistent with proper pitch, to maintain maximum headroom. Cut piping accurately to measurements established at the building, work into place without springing, forcing or cutting of the building structure, and install as directly as possible between connecting points parallel with or at right angles to building construction, except as required to obtain pitch.

E. Unless otherwise shown, run piping within the building, concealed in the walls, furred spaces, pipe spaces or above suspended ceilings. Unless otherwise noted, do not build in or bury horizontal piping in partitions. Install all exposed piping as closely as possible to walls, ceilings and columns, consistent with access and applicable insulation requirements.

F. This project includes a return air plenum ceiling. Regardless of materials specified, all system piping and/or materials shall be non-combustible and shall be in full compliance with the requirements set forth in the IPC.

G. All piping to drain to low points. Low points will be provided with drain valves with hose thread. All piping shall have high points vented with ball valve, nipple and threaded cap.

H. Do not install trapped lines where water cannot be drained or air can accumulate without being vented.

I. Piping shall run square with building lines.

J. Piping shall not be insulated or covered until tested and until building is closed in.

K. Necessary drains, off-sets, vents and drips shall be provided for coordination of the work as part of the contract.

L. Piping shall not be installed over electrical transformers, panels, switchgear, substations, and control panels as per the National Electric Code. No piping shall be installed in elevator machine rooms unless it is directly related to the room's system equipment.

M. Allow clearance for expansion and contraction.

N. Install isolating fittings between sections of ferrous and non- ferrous pipe or connected equipment.

O. Valves shall be installed with stems above horizontal.

P. Valves shall be installed on all sides of equipment and control valves to allow isolation for repair.

Q. Do not support piping from other piping, conduits or equipment. Provide additional bracing to prevent movement of trapeze piping, or any singular run of pipe to fixtures. Provide additional bracing on all piping through walls to flush valves to prevent movement during normal operation or performing maintenance on valves.

R. Thermometers and gauges shall be installed where indicated on the drawings, required by equipment specifications and where indicated elsewhere in the specifications. Gauges shall be located at an elevation that can be readable.

S. Unions shall be provided adjacent to all valves, at equipment connections, and where necessary to facilitate dismantling of the piping system.

T. Ball valves to be installed with the proper clearance for operating the valve handle. A minimum clearance of 10" from center of valve to wall must be maintained for ease of operation.

U. Thermometers are to be located so they can easily be seen from the floor in front of unit. Make final adjustment by tilting thermometer. Locate bulb in waterway with an oversized tee or elbow fitting.

V. Install pressure gauges on incoming services both domestic water and fire services. Locate pressure gauge after main shut-off valve and ahead of water meter if one is provided within building.

W. All pipe unions installed shall be accessible. Unions shall not be concealed or located in places where they cannot be maintained.

X. Support and bracing of 4" and above pipe shall be in accordance with the CISPI Standards and IPC Chapter 3.

Y. All hangers, anchors, support and guides for piping and equipment shall be securely fastened to the building structure and/or floors with concrete decking with the following exception: Hangers, anchors, support and guides shall not be fastened to or through metal roof decking (i.e. bare metal decking or metal deck supporting a roofing system).

3.2 TAGS, CHARTS, AND IDENTIFICATION

A. All piping shall be labeled in accordance with IPC 303.1 and 303.4.

B. Identify each valve in all systems with black, numbered and stamped 1-1/2" brass or aluminum tags fastened to valve by brass chain and S-hook.

C. Piping Identification: Provide identification and safety products, semi-rigid plastic, wraparound pipe markers with flow arrows and conforming to ANSI A13.1. Locate marker at each valve, changes in direction, where pipes pass thru barriers and every 25' of horizontal runs. Lettering on background shall be in accordance with the following colors:

Legend	Background	Lettering
1. Gas	- Yellow	- Black
2. Fire Protection	- Red	- White
3. Domestic Cold Water	- Green	- White
4. Domestic Hot Water (110° ^ 140°)	- Yellow	- Black
5. Domestic Hot Water Return (110° ^ 140°)	- Yellow	- Black
6. Sanitary Drainage	- Green	- White
7. Condensate Drainage	- Yellow	- Black
8. Vent	- Yellow	- Black
9. Storm Drainage	- Green	- White
10. Medical Gas	Conform to NFPA-99 Regulations	
11. Plant Compressed Air	- Yellow	- Black

D. Provide 1/8" scale diagrams showing location, number and service or function of each tagged item.

1. Frame diagrams in approved metal frames with clear acrylic front, hinges, and locks.

2. Secure to wall in Mechanical Room.

3. Provide two additional separate copies permanently covered and bound.

E. Available Manufacturers: Subject to compliance with requirements, manufacturer's offering identification markers which may be incorporated in the work are limited to the following:

Seton

Brimar

B-Line

Marking Services, Inc.

3.3 WELDING

A. All concealed and inaccessible black steel piping shall be welded.

B. All black steel piping larger than 2 inch shall be fusion welded.

C. All elevated pressure (above 14" WC) natural /propane gas piping within buildings shall be welded joints.

D. All elbows, tees and branch connections shall be made with welding fittings ANSI B16.9.

E. Welding shall be in accordance with the ASME Boiler and Pressure Vessel Code Section IX.

F. Furnish welder test certificate for review. Certificates of successful qualification by the following organizations shall be acceptable.

1. ASME Boiler and Pressure Vessel Code

2. ANSI Code for Pressure Piping

3. National Certified Pipe Welding Bureau

4. Military Specification MIL-STD-248

3.4 SOLDERING/BRAZING

A. Connections between copper tubing and copper sweat fittings shall be made by soldering using Taramet Sterling or approved substitute. Flux shall be non-corrosive type "Nokorode" or approved substitute or as recommended by the manufacturer of the solder.

B. All solder shall be "lead nickel and antimony free" in accordance with the Federal Safe Drinking Water Act Amendments of 1986 and 1996 as is ASTM B-32 Grade TC.

Composition:

Tin	95%
Copper	4.0 – 5.0%
Selenium	.04 - .2%
Tensile Strength	7,130 psi
Shear Strength	5,970 psi
Melting temperature	410°F

C. Tubing shall be cut square and then reamed and deburred. End of tubing and inside of fitting cup shall be cleaned with steel wool and the flux shall be applied to the clean surface before soldering. After soldering, the excess solder shall be wiped off while still plastic.

D. Silver brazing alloy shall be equal to and shall be used for joints in:

1. Medical Gas Piping (All Systems)

2. Medical Vacuum Piping

E. Brazed Joints:

1. All brazed joints shall be cleaned. An approved flux shall be applied; joint filler metal shall conform to AWS A5.8.

2. Flux shall meet AWS Standard A5.31, Type F83-A or F83-C.

F. 410 solder shall be used for all joints in:

1. Domestic cold water

2. Domestic hot water

3. Domestic hot water return

4. Copper drainage piping

5. Plant compressed air

G. Lead-Tin (50-50) solder or any solder containing lead shall NOT be used or permitted for joint connections on this project.

H. Where the silver brazing is performed in a confined non-ventilated space, a non-toxic, cadmium-free brazing alloy such as Stay-Brite shall be used instead of Easy-Flo. Bring joint to solder temperature or brazing temperature in as short a time as possible.

I. Form continuous solder bead or brazing filler bead around entire circumference of joint.

J. Wipe excess solder from joint area while solder is still plastic.

K. Solder joints shall be in accordance with IPC Section 605.2, 605.14.3 and ASTM B838. Flux shall conform to ASTM B-813.

3.5 PRESS-FIT SYSTEM

A. All new domestic water piping installed on this project shall be a solderless, press-fit, domestic water system. The system shall be Viega/Rigid copper press fitting system. Fittings shall be rated 0˚F to 250˚F at 200 psi and tested to 600 psi.

B. Fittings shall meet ANSI/NSF 61, – ASME B-16.22 and ASTM B88. Elastomeric seals shall meet ASTM D-2000.

C. Mechanical joining shall be recognized by:

IPC International Plumbing Code

SBCCI Standard Plumbing Code

IAPMO Uniform Plumbing Code

PHCC National Standard Plumbing Code

D. Copper and copper alloy press fittings shall conform to material requirements of ASME B16.18 or ASME B16.22 and performance criteria of IAPMO PS 117. Sealing elements for press fittings shall be EPDM. Sealing elements shall be factory installed or an alternative supplied by fitting manufacturer. Press end shall have SC (Smart Connect) feature design (leakage path). Smart Connect™ (SC Feature). In press-fit ½" to 4" dimensions, the Smart Connect Feature assures leakage of liquids and/or gases from inside the system past the sealing element of an unpressed connection. This feature shall provide the installer quick and easy identification of connections which have not been pressed prior to putting the system into operation.

E. Press Connections: Copper press fitting joints shall be made in accordance with the manufacturer's installation instructions. The tubing shall be fully inserted into the fitting and the tubing marked at the shoulder of the fitting. The fitting alignment shall be checked against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting. The joints shall be pressed using the tool approved by the manufacturer.

F. Installer shall be a qualified installer, licensed within the jurisdiction, and familiar with the installation of press-fit copper press joint systems. Press-fit copper press fittings shall be installed using the proper tool, actuator, jaws and rings as instructed by the press fitting manufacturer. The installation of copper tubing for hot and cold water distribution systems shall conform to the requirements of the ICC International Plumbing Code or IAPMO Uniform Plumbing Code.

G. Note: Viega ProPress, Nibco Press-fit, and Apollo "Express" installation shall only be permitted on this project. Push-on shark-teeth, or any type connection fittings that are not press-fit, shall NOT be approved.

H. T-drill mechanically formed tee fittings shall be used in conjunction with the press-fit copper system in accordance with the IPC Chapter 6 Section 605.5.1, 605.5.1.2 and 605.14.1. Use caution around combustible material and follow all safety guidelines for open flame during silver brazing.

END OF SECTION 22 00 10

SECTION 22 00 30

INSULATION & COVERING – PLUMBING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

1.2 DESCRIPTION OF WORK

A. This section includes insulation and covering furnished and installed on the following piping systems and equipment:

1. Domestic cold water.

2. Domestic hot water supply and return

3. “Primary” Horizontal rainwater conductors including underside of roof drains. “Secondary” rainwater systems insulation is not required.

1.3 REFERENCE STANDARDS

A. Refer to Section 220000 for a general description of requirements applying to this section.

B. Materials shall conform to the requirements of the NFPA Code.

1.4 QUALITY ASSURANCE

A. Refer to Section 220010 for a general description of requirements applying to this section.

1.5 SUBMITTALS

A. Submit shop drawings and product data in accordance with Section 220000.

B. Submit the following:

1. Product data on all insulation and covering.

1.6 WARRANTY/GUARANTEE

A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, GENERAL REQUIREMENTS.

PART 2 – PRODUCTS

2.1 PIPE INSULATION MATERIAL

A. Fiberglass:

1. Material: Preformed fiberglass bonded with resins to form circular pipe sleeves with factory applied, white all-service jacket bonded to reinforced foil vapor barrier jacketing. The jacket shall have factory-applied double pressure-sensitive adhesive closure and vapor sealing of longitudinal joints. Thermal Conductivity: .25 per inch at 100 degrees F. Flame spread of 25 and developed smoke of 50 or less.

2. All Valves and Fittings:

   a. Class fiber insert and premolded PVC cover, Manville "Zeston" and "Hi-Lo Temp Inserts" for valves and fittings.

   b. Factory molded fibrous glass fitting covering for fittings.

   c. Mitered sections of pipe covering for valves.

3. Manufacturers: Johns-Manville, Certain-Teed, Owens-Corning.

B. Closed Cell:

1. Material: Flexible elastomeric foamed plastic closed cell structure insulation 25/50 rated with a flame spread rating of 25 or less and a smoke developed rating of 50 or less.

2. Flexible pipe insulation shall be a foamed plastic closed cell structure material, with a thermal conductivity of not more than 0.27 Btu/Hr./Sq. Ft./Inch at a mean temperature of 75 degrees F. The insulation shall have an average density of at least 2 pounds per cubic foot, shall be self-extinguishing, and shall have a water vapor transmission rating of not more than 0.1 perms. Between temperature limits of -40 degrees F and plus 220 degrees F, the insulation shall not indicate any deviation from its original state.

3. Manufacturers: Armacel, Insul-Tube, Nomaco Insulation.

4. Specification Compliance: (Latest accepted Standards and Codes)

   IECC 804.5: Insulation thickness for domestic hot and recirculation mains.

   ASTM-E-84 Flame spread and smoke developed.

   NFPA 255: Standard method of test of surface burning of building materials.

   ASTM C177: Thermal conductivity.

   NFPA 90A, 90B: Flame & smoke rating

   ASTM-C-534 Type 1 Tubular Grade, Self-Sealing

   UL 181 Factory made air ducts and air connectors. (Armacell UL181 has to do with mold growth)

   UL723 Test for surface burning characteristics of building materials.

   ASTM G21/C1338: Fungi resistance

ASTM G2: Bacterial Resistance

ASTM D1056, 2B1: Standard spec for flexible cellular materials.

MIL-P-15280J, FORMT

MIL-C-3133B (MIL STD 670B) Grade SBE-3

MEA 96-85M

C. Covering of Pipe Insulation Outdoors:

1. Wrapping: Wrap insulation with embossed .016" aluminum jacket.
2. Fastenings: Cover shall be held in place with soft aluminum bands on 12" centers.
3. Valves and Fittings: Weatherproof all valves and fittings.
4. Manufacturers: Johns-Manville, Certain-Teed, Owens-Corning, Knauf.

D. Protective cover for insulation in wet areas indoors:

1. PVC heavy duty fitting covers and jacketing for kitchen wet areas.
2. Fitting covers shall be glossy white, high impact, UV resistant PVC.
3. Operating Temperature Limit: Up to 150ºF.
4. Flame Spread: 25 or less.
5. Smoke Developed: 50 or less.
6. Grade: Weatherable.
7. Color: White
8. Finish: Gloss
9. Fitting covers and jacketing shall be “Zeston” 300 Series PVC, heavy duty covers and “Zeston” PVC jacketing.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Do not install until systems have been tested and meet requirements.

B. Heavy work which may damage insulation shall have been completed in the vicinity of the insulation work.

C. All installations shall be made by skilled craftsmen regularly engaged in this type of work.

D. Insulation shall be continuous thru-wall, ceiling and floors.

E. Pipe and equipment to be clean and dry prior to insulating.

F. Install all insulation in strict conformance with manufacturer's instructions.

G. Install pipe insulation by slitting tubular sections and applying onto piping or tubing. Alternately, whenever possible, slide unslit sections over the open ends of piping or tubing. All seams and butt joints shall be adhered and sealed using Armaflex 520 or 520 BLV Adhesive. If when using AP Armaflex SS, only the butt joints shall be adhered using Armaflex 520 or 520 BLV Adhesive, Armaflex HT 625 Adhesive shall be used with HT Armaflex.

H. Insulation shall be pushed onto the pipe, never pulled. Stretching of insulation may result in open seams and joints.

I. Tape the ends of the copper tubing before slipping the Armaflex insulation over the new pipes to prevent dust from entering the pipe.

J. All edges shall be clean cut. Rough or jagged edges of the insulation shall not be permitted. Proper tools such as sharp, non-serrated knives must be used.

K. On cold piping, insulation shall be adhered directly to the piping at the high end of the run using a two-inch strip of Armaflex 520 or 520 BLV Adhesive on the ID of the insulation and on the pipe. All exposed end cuts of the insulation shall be coated with Armaflex 520 or 520 BLV Adhesive. All penetrations through the insulation and termination points must be adhered to the substrate to prevent condensation migration.

L. Sheet insulation shall be used on all pipes larger than 6” IPS. Insulation shall not be stretched around the pipe. On pipes larger than 12” IPS, adhere insulation directly to the pipe on the lower 1/3 of the pipe.

M. Seams shall be staggered when applying multiple layers of insulation.

3.2 VALVES, FLANGES AND FITTINGS:

A. All fittings shall be insulated with the same insulation thickness as the adjacent piping. All seams and mitered joints shall be adhered with Armaflex 520 or 520 BLV Adhesive. Screwed fittings shall be sleeved and adhered with a minimum 1” overlap onto the adjacent insulation. Armaflex HT 625 Adhesive shall be used with HT Armaflex.

B. Valves, flanges, strainers and Victaulic couplings shall be insulated using Armaflex donuts that shall then be covered with sheet or oversized tubular insulation.

3.3 HANGERS

A. Support piping system using high density inserts with sufficient compressive strength. The pipe support insulation shall be elastomeric foam with the same or greater thickness than the pipe insulation. All joints shall be sealed with Armaflex 520 or 520 BLV adhesive.

B. Standard and split hangers: Piping supported by ring hangers shall have hangers insulated with the same insulation thickness as the adjacent pipe. All seams and butt joints shall be sealed with Armaflex 520 or 520 BLV Adhesive. Armaflex HT 625 Adhesive shall be used with HT Armaflex.

Ring hangers may be sleeved using oversized tubular insulation. On cold piping, insulation shall extend up the hanger rod a distance equal to four times the insulation thickness. Insulation tape may be used to a thickness equal to the adjacent insulation thickness.

C. Clevis Hangers or other pipe support systems: Saddles shall be installed under all insulated lines at unistrut clamps, clevis hangers or locations where the insulation may be compressed due to the weight of the pipe. All piping shall have wooden dowels or blocks of a thickness equal to the insulation inserted and adhered to the insulation between the pipe and the saddle.

It is highly recommended for continuous insulation protection to use hanger sizes equal to the outer diameter of the pipe plus insulation thickness

D. Armafix IPH o Armafix NPH can be used to prevent compression of insulation at standard split, clevis hangers or other pipe support systems. To minimize the movement of Armafix, it is recommended that a pair of non-skid pads be adhered to the clamps. In addition, to prevent loosening of the clamps, use of an antivibratory fastener, such as a nylon-locking nut, is also recommended.

3.4 PIPE COVERING (FOAMED PLASTIC TYPE)

A. All joints and seams shall be sealed with a compatible adhesive. Approved adhesives are as follows:

Armacel No. 520 (Low VOC use 520 BLV

Benjamin Foster Company No. 85-75 up to 200 degrees F.

Contractor may use self-sealing insulation in lieu of above.

B. Fitting covers shall be fabricated from the foamed plastic pipe insulation or from sheet insulation of the identical material. The fabrication shall be in accordance with manufacturer's instructions, and all seams mitered joints shall be joined using the adhesives described.

3.5 PIPE INSULATION – TYPES & THICKNESSES

A. Flexible Closed Cell:

Piping System	Up to 3"	Over 3" to 6"	Over 6"
Cold Water	½"	½"	¾"
Hot Water (120º)	1"	1"	1-1/2"
Hot Water Return (120º)	1"	1"	1-1/2"
Hot Water (140º)	1"	1"	1-1/2"
Hot Water Return (140º)	1"	1"	1-1/2"
Condensate Waste	½"	½"	-
Horizontal Storm (Primary)	½"	½"	¾"
Horizontal Storm (Secondary)	-----Not Required-----		
Underside of Roof Drains	½"	½"	¾"
Branch Waste From EWC's	½"	---	---
Handicap Lav Waste & Water	½"	---	---
Soil/Waste Piping Above Ceiling	½"	½"	¾"

B. Fiberglass:

Piping System	Up to 3"	Over 3" to 6"	Over 6"

Cold Water	½”	½”	¾”
Hot Water	1”	1”	1-1/2”
Hot Water Return	1”	1”	1-1/2”
Hot Water	1”	1”	1-1/2”
Hot Water Return	1”	1”	1-1/2”
Condensate Waste	½”	½”	---
Horizontal Storm (Primary)	½”	½”	¾”
Horizontal Storm (Secondary)	½”	½”	¾”
Underside of Roof Drains	½”	½”	---
Soil/Waste Piping Above Ceiling	½”	½”	¾”

END OF SECTION 22 00 30

SECTION 22 01 10

DRAINAGE SYSTEMS – PLUMBING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the work specified in this Section.

1.2 DESCRIPTION OF WORK

A. This section includes:

1. Soil and waste piping system work as indicated on drawings and schedules, and by requirements of this section.

2. Applications for soil and waste piping systems include the following:

   a. Above ground soil, waste and vent piping within buildings including soil stacks, vent stacks, horizontal branches, traps and connections to fixtures and drains.

   b. Underground building drain piping including mains, branches, traps, connections to fixtures and drains, and connections to stacks, extension from the building, terminating at connection to site sewer.

3. Storm water drainage piping as indicated on drawings and by requirements of this section.

4. Insulation for soil and waste and storm water drainage as specified in Section 220030 is included as work of this section.

5. Trenching and backfilling required in conjunction with underground building drainage and site drainage piping as specified in Section 220000 is included as work of this section. Refer to Division I.

1.3 REFERENCE STANDARDS

A. Refer to Section 220000 for a general description of requirements applying to this section.

1.4 QUALITY ASSURANCE

A. Refer to Section 220010 for a general description of requirements applying to this section, and a listing of all applicable codes.

1.5 SUBMITTALS

A. Submit shop drawings and product data in accordance with Section 220000.

B. Submit the following:

1. Product data on all systems equipment.

C. See requirements for submission of cross-referencing information.

1.6 WARRANTY/GUARANTEE

A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, GENERAL REQUIREMENTS.

PART 2 – PRODUCTS

2.1 PIPING UNDERGROUND

A. Interior:

1. Sanitary, storm water and condensate waste drainage piping within the building and extending beyond the building wall, unless otherwise noted on the plans shall be an option selection of a, b, or c below:

a. Service weight hub and spigot pattern cast iron soil pipe and fittings with neoprene gaskets.

b. Hubless cast iron soil pipe and fittings with cast iron coupling clamps and gaskets or heavy duty 3.04-.016" thick stainless steel bands.

c. PVC Schedule 40 pipe and fittings with solvent cement joints.

2. Kitchen Sanitary Drainage and/or Mechanical Room Sanitary Drainage: All Kitchen and/or Mechanical Room sanitary below slab piping and fittings shall be service weight cast iron hub and spigot fitting with butyl rubber gaskets or hubless fittings with heavy duty couplings (no PVC shall be acceptable).

2.2 PIPING ABOVE GROUND

A. All above ground storm water, condensate, soil, waste and vent piping shall be:

1. Hubless cast iron soil pipe with cast iron drainage fittings, couplings and stainless steel clamp bands for piping 2" and larger.

2. Copper tubing, type DWV with wrought copper solder type drainage fitting for piping smaller than 2" in size.

3. PVC pipe and fittings type DWV with solvent cement joint connections. (Not permitted in areas of plenum rated ceilings.)

2.3 SPECIAL EXPANSION COMPENSATION

A. Special expansion compensation products required for storm, condensate, soil and waste piping systems include the following types:

B. Cast Iron Drainage System Expansion Joints: Cast-iron body, adjustable bronze sleeve, bronze bolts with wing nuts; for vertical installation only.

C. PVC Drainage System Expansion Joints: Factory prelubricated "O" ring expansion joint fitting. Installation must be in strict conformance with manufacturer's recommendations.

D. Available Manufacturers: Subject to compliance with requirements. Manufacturers offering expansion joints which may be incorporated in the work include:

1. Cast Iron Piping Systems - J.R. Smith or approved substitute.

2. PVC Piping Systems – George Fisher or approved substitute.

PART 3 – EXECUTION

3.1 INSTALLATION OF SOIL AND WASTE PIPING

A. The Plumbing Contractor shall install a complete system of sanitary drainage piping as shown on the drawings. All drainage lines shall be properly run, trapped and vented in accordance with the local Plumbing Code and all dry vents, back vents, loop vents, revents or special vents required by the Code shall be furnished and installed by the Plumbing Contractor.

B. Drainage lines of the sizes shown on the drawings shall be extended within the building with branches connecting to the base of all soil, waste and vent stack, etc., leaving outlets for connection to all fixtures, floor drains, as required.

C. All changes in direction of drainage piping shall be installed with "Y" branches and 1/8 bends. All stacks shall be supported with concealed pipe clamps or hangers as required and the openings in the roof for the vent pipes will be provided by this Contractor.

D. All drainage piping which will be located above suspended ceilings shall be checked for slope to assure positive drainage, prior to installation of the ceilings. Pressure tests for leaks, as hereinafter specified, shall also be performed prior to ceiling installation.

E. Install soil and vent piping pitched to drain at minimum slope of 1/4" per foot (2%) for piping 3" and smaller, and 1/8" per foot (1%) for piping 4" and larger.

F. Vertical to horizontal change in direction to be made with long radius fittings.

G. Support all soil and waste piping per IPC Section 308.5, 308.6 and 308.7.

H. All hangers, anchors, support and guides for piping and equipment shall be securely fastened to the building structure and/or floors with concrete decking with the following exception: Hangers, anchors, support and guides shall not be fastened to or through metal roof decking (i.e. bare metal decking or metal deck supporting a roofing system).

3.2 INSTALLATION OF STORM WATER DRAINAGE PIPING

A. Connect piping to roof drains and outlets provided in gutters, install rainwater conductors and extend to underground storm building drains as indicated.

B. Underground storm building drains shall be extended from the building, terminating beyond the building wall.

C. Connect to exterior downspouts, install cast iron downspout shoes, and extend piping from the building wall.

D. All changes in direction of drainage piping shall be installed with "Y" branches and 1/8 bends. All stacks shall be supported with concealed pipe clamps or hangers as required, and the openings in the roof for the vent pipes will be provided by this Contractor.

E. All drainage piping which will be located above suspended ceilings shall be checked for slope to assure positive drainage, prior to installation of the ceilings. Pressure tests for leaks, as hereinafter specified, shall also be performed prior to ceiling installation.

F. Install storm water drainage piping pitched to drain at minimum slope of 1/8" per foot (1%) for piping 4" and larger.

G. Vertical to horizontal change in direction to be made with long radius fittings.

H. All hangers, anchors, support and guides for piping and equipment shall be securely fastened to the building structure and/or floors with concrete decking with the following exception: Hangers, anchors, support and guides shall not be fastened to or through metal roof decking (i.e. bare metal decking or metal deck supporting a roofing system).

3.3 INSTALLATION OF SPECIAL EXPANSION COMPENSATION PRODUCTS

A. Expansion Joints: Install expansion joints on vertical risers as indicated, and/or as required by International Plumbing Code.

B. PVC piping systems in multi-story (four stories or more) shall require "O" ring expansion joints to compensate for length changes in soil, waste and vent stacks. Expansion joints shall be required at every floor level for soil and waste stack and at alternate floors for vent stacks and rainwater conductors.

3.4 INSTALLATION OF CLEANOUTS

A. Cleanouts: Install in sanitary piping and storm conductor and building drain piping as indicated, and/or as required by International Plumbing Code; at each change in direction of piping greater than 45 degrees; at minimum intervals of 100' for all size straight run piping; and at base of each conductor. Install floor and wall cleanout covers for concealed piping, select type to match adjacent building finish.

3.5 INVERTS AND ELEVATIONS

A. Indicated inverts and elevations of existing utilities are approximate and based on the best information available. Upon award of Contract, Contractor shall verify in the field all such information and report any discrepancies to the Engineer before proceeding with work.

3.6 PIPING INSTALLED IN FILLED GROUND

A. Piping located below floor slab in filled areas shall be supported either from the floor slab, or with masonry piers to undisturbed earth. Drainage piping shall be supported at each joint. Exterior piping located in filled areas shall be supported with piers.

B. Details of supports and method of installation shall meet with the approval of the Engineer.

3.7 INSPECTION

A. The Plumbing Contractor shall, upon completion of the drainage systems, secure from the Inspector and/or the Municipality under which the installation was made and inspected, certificates or letters of approval indicating the system has been installed satisfactorily. The Plumbing Contractor shall certify that all inspection fees, permits and charges have been duly paid.

END OF SECTION 22 01 10

SECTION 22 01 20

DOMESTIC WATER SYSTEMS - PLUMBING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the work specified in this Section.

1.2 DESCRIPTION OF WORK

A. This Section includes:

1. Domestic water piping systems work is indicated on drawings and schedules and by requirements of this section.

B. Applications for water piping systems include the following:

1. Domestic cold-water piping.

2. Domestic hot-water piping.

3. Domestic recirculating-water piping.

C. Insulation for domestic water piping as specified in Section 220030 is included as work of this section.

1.3 REFERENCE STANDARDS

A. Refer to Section 220000 for a general description of requirements applying to this section.

1.4 QUALITY ASSURANCE

A. Refer to Section 220010 for a general description of requirements applying to this section.

1.5 SUBMITTALS

A. Submit shop drawings and product data in accordance with Section 220000.

B. Submit the following:

1. Product data on all specialties and systems equipment.

1.6 WARRANTY/GUARANTEE

A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, GENERAL REQUIREMENTS.

PART 2 – PRODUCTS

2.1 DOMESTIC WATER PIPING MATERIALS AND PRODUCTS

A. Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in domestic water piping systems. Where more than 1 type of materials or products are indicated, selection is Installer's option.

2.2 BASIC PIPE, TUBE AND FITTINGS

A. Provide pipe, tube, and fittings complying with Division 22 Basic Materials and Methods section "Pipe, Tube, and Fittings", in accordance with the following listing:

B. Interior Domestic Water Piping:

Tube Size 4" and Smaller:	Copper tube.
Wall Thickness:	Type "L" hard-drawn temper.
Fittings:	Wrought-copper, solder-joints.

2.3 BASIC PIPING SPECIALTIES

A. Provide piping specialties complying with Section 220010 Basic Materials and Methods in accordance with the following listing:

Pipe escutcheons

Dielectric unions

Drip pans

Pipe sleeves

Sleeve seals

2.4 SPECIAL PIPING SPECIALTIES

A. Water Hammer Arresters: Provide bellows or piston type water hammer arresters, pressure rated for 250 psi, tested and certified in accordance with PDI Standard WH-201.

2.5 BASIC VALVES

A. Provide valves complying with applicable Division 22 sections "Valves", in accordance with the following listing:

B. Sectional Valves:

2-1/2" and Smaller:	Ball Valves.
	Gate Valves.
3” and Larger:	Ball Valves.
	Butterfly Valves.

C. Shutoff Valves:

2-1/2" and Smaller:	Ball Valves.
	Gate Valves
3" and Larger:	Ball Valves.
	Butterfly Valves.

D. Drain Valves:

All	Hose End Threaded Gate or Ball Valves.

E. Balancing Valves:

2" and Smaller:	Ball Valves (Circuit Setter Type).
	(w/ Memory Stop)

F. Check Valves:

All Sizes:	Swing Check Valves. Horizontal Installations
	Spring Check Valves. Vertical Installations

2.6 BASIC THERMOMETERS AND GAUGES

A. Provide thermometers and gauges complying with Division 22 Basic Materials and Methods Section "Meters and Gauges", in accordance with the following listing:

Pressure gauges

Glass thermometers

Pressure and temperature connections

2.7 BACKFLOW PREVENTERS

A. Provide, of the type indicated on the drawing schedule, reduced pressure principal type, blackflow

preventers shall consist of an assembly including shutoff valves on inlet and outlet, and strainer on inlet. Backflow preventers shall include test cocks, and pressure-differential relief valve located between two positive seating check valves. Construct in accordance with ASSE Standard.

2.8 SYSTEMS EQUIPMENT MANUFACTURERS

A. Refer to Plumbing Fixture and Equipment Schedule for type, number, size and manufacturer of all equipment and accessories.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering equipment which may be incorporated in the work are limited to the following:

Shock Absorbers:

Zurn

Josam

Wade

Watts

Smith

PPP Inc.

MIFAB

Backflow Preventers

Conbraco

Febco

Cla-Val

Wilkins

ITT Grinnell

Neptune

Watts

PART 3 – EXECUTION

3.1 INSTALLATION OF BASIC IDENTIFICATION

A. Install mechanical identification in accordance with Section 220010 Basic Materials and Methods.

B. Support vertical piping at floor levels using approved riser clamps. Clamp material shall be compatible with pipe material. Maximum vertical spacing shall be 10’-0”. Domestic water piping

shall be supported in accordance with the International Mechanical Code, Section 305 and Table 305.4 Spacing Intervals, or in accordance with MSS-SP-69. International Plumbing Code's latest edition, Section 308.5, accept as follows:

1. Copper tubing ½" to 1-1/4" nominal size, not to exceed 6 ft. horizontal intervals.

2. Copper tubing 1-1/2" and larger nominal size, not to exceed 10 ft. horizontal intervals.

3. Copper tubing ½" to 1-1/4" nominal size, not to exceed 10 ft. vertical intervals.

4. Copper tubing 1-1/2" and larger nominal size not to exceed 10 ft. vertical intervals.

3.2 INSTALLATION OF VALVES

A. Install valves in accordance with Division 22 Basic Materials and Methods section, "Valves".

B. Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves 2 or more fixtures, equipment connections, and elsewhere as indicated.

C. Shutoff Valves: Install on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and elsewhere as indicated.

D. Drain Valves: Install on each plumbing equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere where indicated or required to completely drain domestic water piping system.

3.3 INSTALLATION OF BACKFLOW PREVENTERS

A. Install backflow preventers where indicated, and where required by International Plumbing Code. Locate in same room or area as equipment being protected.

3.4 INSTALLATION OF EXPANSION COMPENSATION PRODUCTS

A. This project shall require the installation of expansion compensators.

B. Furnish and install expansion compensation products in accordance with Section 220210 Basic Materials and Methods – HVAC

3.5 INSTALLATION OF THERMOMETERS AND GAUGES

A. Install thermometers and gauges in accordance with Section 220010 Basic Materials and Methods.

3.6 EQUIPMENT CONNECTIONS

A. Piping Runouts to Fixtures: Provide hot and cold water piping runouts to fixtures of sizes indicated, but in no case smaller than required by International Plumbing Code.

B. Equipment furnished by the Owner or Contractors other than this Contractor: After equipment has been set in place, this Contractor shall furnish all labor and material required to make final connections, between roughing-in and the equipment. Install valves, fittings, trim and appurtenances furnished with the equipment. All exposed piping in the kitchen areas shall be chrome plated. Piping in other areas shall be of the same material as the system to which it connects.

3.7 SPARE PARTS

A. Furnish to Owner, with receipt, one valve key for each key operated hydrant, bibb, or faucet installed.

END OF SECTION 22 01 20

SECTION 22 01 90

TESTING – PLUMBING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the work specified in this Section.

1.2 DESCRIPTION OF WORK

A. Extent of plumbing systems to be tested is indicated on the drawings and by requirements of this section.

B. Applications of tests include the following:

1. Interior Piping

a. Domestic cold, hot & hot water return piping

b. Sanitary and condensate waste drainage piping

c. Storm water drainage piping

C. See Fire Protection Specifications for testing of Fire Protection Systems.

1.3 REFERENCE STANDARDS

A. Refer to Section 220000 for a general description of requirements applying to this section.

1.4 QUALITY ASSURANCE

A. Refer to Section 220010 for a general description of requirements applying to this section.

1.5 SUBMITTALS

A. Submit test reports in accordance with Section 220000.

1.6 WARRANTY/GUARANTEE

A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, GENERAL REQUIREMENTS.

PART 2 – PRODUCTS

2.1 PIPE & FITTING REPLACEMENTS

A. Refer to Section 220010 for replacement of any defective pipe or fittings. Replacement shall include all required uncovering, excavating, recovering and backfilling.

PART 3 – EXECUTION

3.1 GENERAL

A. All exterior or interior piping shall be tested and approved before backfilling or concealing. Failure to secure the approval of the Municipal Inspector, Utility Company's Inspector or the Inspector of the Architect/Engineer makes it mandatory for the Contractor to completely expose the piping for testing. All expense involved in the uncovering of the piping for the test and recovering shall be borne by the respective Contractor with no change in Contract.

B. All equipment, material and labor required for testing a plumbing system or part thereof shall be furnished by the Plumbing Contractor responsible for installing the work.

3.2 INTERIOR PIPING

A. Drainage Piping:

Rough Plumbing: The piping of all plumbing storm, condensate waste, sanitary drainage and venting systems shall be tested upon completion of the rough piping installation by water or air and proved watertight. Where required by the code official, the cleanout plugs shall be removed to ascertain if the pressure has reached all parts of the system. Either of the following methods shall be used:

1. Water Test: The water test shall be applied to the drainage system either in its entirety or in sections after rough piping has been installed. If applied to the entire system, all openings in the piping shall be closed, except the highest opening, and the system filled with water to the point of overflow. If the system is tested in sections, each opening shall be plugged except the highest opening of the section under test, and each section shall be filled with water, but a section shall not be tested with less than a 10-foot head of water.

   In testing successive sections, at least the upper 10 feet of the next preceding section shall be tested, so that a joint or pipe in the building (except the uppermost 10 feet of the system) shall not have been subjected to a test of less than a 10-foot head of water. The water shall be kept in the system or in the portion under test for a minimum of 15 minutes before inspection starts. The system shall then be tight at all points.

2. Air Test: The air test shall be made by attaching an air compressor testing apparatus to an opening, and, after closing all other inlets and outlets to the system, forcing air into the system until there is a gauge pressure of 5 pounds per square inch (5 psi) or a minimum of 10-inch column of mercury. This pressure shall be held without introduction of additional air for a minimum period of 15 minutes.

   Precautionary Note: The compressibility of air and/or other gases result in tremendous amounts of stored energy, even at lower pressures. Over-pressurizing creates a substantial hazard to personnel and property near the area should a failure occur. Consult with the Plastic Pipe Institute (PPI) for statements and alerts, along with State and local safety offices.

Finished Plumbing: Where required by the code official, after the plumbing fixtures have been set and their traps filled with water, their connections shall be tested and proved gas and water-tight by one of the following test methods.

1. The final test for gas and water-tightness of the completed drainage and vent systems shall be made by a smoke test or other approved method. The test shall be made by filling all traps with

water, and then introducing into the system smoke produced by one or more smoke machines. When the smoke appears at stack openings on the roof, the stack openings shall be closed and a pressure equivalent to a 1" water column shall be built and maintained for the period of the inspection.

2. After the plumbing fixtures have been set and their traps filled with water, their connections shall be tested and proven gas and water-tight by plugging the stack openings on the roof and building drain where the drain leaves the building and with air introduced into the system equal to the pressure of a 1-inch water column. This shall be accomplished by the use of a "U" tube or manometer inserted in the trap of a water closet. Such pressure shall remain constant for the period of inspection without the introduction of additional air.

Building sewer test: The building sewer shall be tested by insertion of a test plug at the point of connection with the public sewer or individual sewage disposal system. The building sewer shall then be filled with water under a head of not less than 10 feet. The water level at the top of the test head of water shall not drop for at least 15 minutes.

B. Domestic Water Piping: All new, altered, extended or replaced interior water piping installed shall be tested at 100 psig maintaining the pressure for four hours with not more than 1% drop in pressure. The system shall be filled with water which shall remain in the system until the water and the piping are the same temperature. If water pipe testing is under the jurisdiction of the local inspector, his requirements shall be used; however, they shall be not less than specified herein. The tests shall be performed in the presence of the representative of the Architect/Engineer and to his satisfaction.

C. Compressed Air Piping: Compressed air piping shall be tested at 125 psi. The pressure shall be maintained on the system a minimum of 30 minutes without any loss in pressure. If a loss in pressure occurs, leakage shall be corrected and piping retested.

3.3 STERILIZATION

A. After final testing for leaks, all new potable water piping installed including water service piping, shall be flushed to remove foreign material.

B. Before placing domestic water systems in service, a qualified service organization shall be engaged, to sterilize the entire building including the exterior water service piping in accordance with the following procedure:

1. Contractor shall provide a 3/4" hose connection somewhere in the main entering the building, or in the Mechanical Room and/or in the meter pit, pump in sufficient sodium hypochlorite to produce a free available chlorine residual of not less than 100 PPM.

2. Proceed upstream from the point of chlorine application opening all faucets and taps until chlorine is detected. Close faucets and taps when chlorine is evident. Consult with the local code department for additional concentrations and durations.

3. When chlorinated water has been brought to every faucet and tap with a minimum concentration of 200 PPM chlorine, retain this water in the system for at least three hours.

4. At the end of the retention period, no less than 100 PPM of chlorine shall be present at the extreme end of the system.

5. Proceed to open all faucets and taps and thoroughly flush all new lines until the chlorine residual in the water is less than 1.0 PPM.

6. Obtain representative water samples from the system for analysis by a recognized Bacteriological Laboratory.

7. If all samples tested for impurities and organisms are negative, a letter and laboratory reports shall be submitted by the service organization to the contractor, certifying successful completion of the sterilization.

8. If any samples tested indicate the presence of harmful impurities and organisms, the entire sterilization procedure shall be repeated.

9. Plumbing Contractor shall provide plumbing connections and power for pumping chlorine solution into the system.

Warning: PVC and CPVC Pipe: Do not use a dry granular calcium hypochlorite as a disinfecting material for water purification in potable water piping systems. The introduction of granules or pellets of calcium hypochlorite with solvent cements and primers (including their vapors), may result in violent chemical reactions.

C. Available Service Organizations: Subject to compliance with requirements, provide the sterilization service of one of the following:

Water Chem

Arc Company, Inc.

Nova Consultants

Artesian Water Co.

END OF SECTION 22 01 90

SECTION 23 02 00

GENERAL PROVISIONS – HVAC

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to work of this Section.

B. This specification or drawing and the design features or resulting construction disclosed, are the property of Furlow Associates, Inc., and shall not be reproduced without written permission.

C. All Mechanical Systems shall be part of and included in all of the following: 230200 thru 230950.

1.2 WORK INCLUDED

A. Provide labor, materials, equipment and supervision necessary to install complete operating HVAC Systems, including all work at the site and within the proposed construction areas to accomplish the required work.

B. Wherever the term "provide" is used, it shall be understood to mean both "furnish" and "install".

1.3 REGULATIONS, CODES AND STANDARDS

A. Work shall be performed in accordance with latest adopted codes, regulations and ordinances by authorities having jurisdiction. Observe all safety regulations.

B. Obtain all permits and inspection certificates and pay all charges.

C. Latest editions of any referenced standards shall govern.

1.4 RELATED WORK

A. Refer to equipment shown or specified in sections of Division 1 thru 14 and 26 that will require Mechanical services and provide such service.

B. Refer to work related to HVAC as shown on the following contract drawings:

Architectural & Structural

Plumbing

Electrical

1.5 COORDINATION

A. The Mechanical, Plumbing and Electrical Contractors are responsible to coordinate all manufacturer's recommended circuit breakers, starters, disconnects and fuse sizes for all equipment. Submission of a

shop drawing will certify that this has been completed. Any necessary changes required will be included as part of this contract.

B. Mechanical Contractor shall coordinate scheduling, submittals and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of independent work elements, with provisions to accommodate items that may be installed at a later time.

C. Mechanical Contractor shall verify utility requirements and all characteristics of operating equipment are compatible with the building utilities. Coordinate the work of all sections related and required for installing, connection and placing in service of all equipment.

D. Mechanical Contractor shall coordinate all space requirements, supports and installation of all mechanical, electrical, plumbing and fire protection work, which are indicated diagrammatically on the Drawings. Verify routing of all pipes, ducts, conduits and equipment connections. Maximize accessibility for other work, and service requirements for maintenance and repairs.

E. Obtain written confirmation from all related trade Contractors and the Owner or his representative that requirements, conflicts, and coordination issues have been discussed and resolved.

F. Submit coordination drawings to verify access and clearances.

1.6 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations..

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installation within unheated shelters.

1.7 SUBMITTALS

A. Shop Drawings:

1. Shop drawings shall be submitted in accordance with Division 1 of these specifications except where herein modified.

2. Shop drawings comprising complete catalog cuts, performance test data for HVAC equipment as required by other sections of Division 23, shall be submitted for review checking. The Contractor shall review these shop drawings for conformance to contract documents prior to submission and affix contractor's signature to each submittal certifying that this review has been done. By approving and submitting shop drawings, product data, samples and similar materials,

the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction data that relates to the work, and has checked and coordinated this information with all of the requirements contained in the contract documents for the work of all trades.

a. The Contractor and equipment manufacturer shall clearly indentify in all submittals and shop drawings any and all applications standards which require additional work to accommodate this equipment and provide a complete and operational system as described in the contract documents.

b. The Contractor shall be completely responsible for any and all additional costs associated with the changes required by this and all other trades.

3. All shop drawing submittals shall have the following identification data, as applicable, contained therein or permanently adhered thereto.

a. Project name.

b. Project number.

c. Sub-contractor's, vendor's and/or manufacturer's name and address.

d. Product identification.

e. Identification of deviation from contract documents.

f. Applicable contract drawings and specification section number.

g. Shop drawing title, drawing number, revision number, and date of drawing and revision.

4. Resubmit revised or additional shop drawings as requested.

5. Wherever shop drawings or vendor's standard data sheets indicate work to be done "by others", it shall be the responsibility of the contractor making the submission to identify by name, the contractor who is to do this work. If the contractor named is other than the contractor making the submission, the shop drawing submission must be reviewed by the named contractor and bear his mark of approval, prior to submission to the Architect/Engineer.

6. Where equipment proposed differs from that shown on the drawings or specified, he shall submit for approval drawings showing the manner in which the layout is affected by the substitution.

7. The Contractor shall keep one copy of approved shop drawings at the job site,, filed in a suitable metal container. The shop drawings shall be cataloged and kept in good repair, and shall be available for use by the Owner, Architect and Engineer.

8. No equipment shall be ordered, fabricated, etc., before approval of shop drawings.

B. Contractor is responsible for the shop drawing coordination and interface with the work of other contracts and adjacent work. The relationship of Contractor’s work shall be verified as it relates to adjacent and critical features of the work of this and all contracts and materials.

C. The Contractor shall submit a complete schedule of all shop drawings required for the scope of work covering all materials and equipment listed in all sections of Division 23, Mechanical, including all documents required for contract closeout, Owner instructions and training, and all turnover items at the completion of the work. This schedule shall be submitted for review and approval within thirty days of contract award and before any subsequent materials are provided for review.

D. The shop drawings provided by the Contractor will be reviewed only once and resubmittals will be reviewed only once. Any other submittals will be billed to the Contractor at the Engineer's standard rates.

1.8 SITE INSPECTION

A. The Contractor shall visit site, inspect, and become aware of all conditions which may effect the work during the estimation phase of his work prior to bid openings. Investigate utilities, protection requirements for adjacent facilities, storage locations, and access to the construction area.

B. Submission of a bid will be deemed evidence of having complied with this requirement.

1.9 SUBSTITUTIONS

A. Whenever a material, article, piece of equipment or system is identified in the following specification or indicated on the drawings by reference to manufacturers' or vendors' names, trade names, catalog numbers or the like, it is so identified for the purpose of establishing the basis of the Bid.

B. Substitution approval must be obtained and included as an addendum item prior to the submission of the bid. An approved substitution shall not be considered as an approval for the Contractor or an equipment vendor to deviate from the written portion of the specifications unless so stated in the addendum.

C. The drawings illustrate the space allocated for equipment and the Contractor shall install the equipment accordingly. If changes are required in the building or arrangement due to substitution of equipment, the Contractor making the substitution must pay for the necessary modifications.

D. The listed equivalent or substituted manufacturers along with the bidding related contractor shall be completely responsible to comply with all requirements on all contract documents. This shall include, but not be limited to all: space requirements, code clearances, type-horsepower-capacities-number and size of services required from other trades including all auxiliary items provided by this Contractor and all other trades, and all manufacturer's specific equipment applications standards and requirements, for approved equipment including that which is basis of design or a substitution. The bidding related contractor and equipment manufacturers shall clearly identify in all submittals and shop drawings any and all applications standards which require additional work to accommodate this equipment and provide a complete and operational system as described in the contract documents. If the bidding contractor or manufacturer does not comply with these requirements then they shall be completely responsible for any and all additional costs associated with the changes required by this and all other trades.

1.10 LUBRICATION

A. Provide and maintain all required lubrication of any equipment operated prior to acceptance by the Owner. Lubrication shall be as recommended by the equipment manufacturer.

B. Provide one year's supply of lubricants to Owner at date of acceptance.

C. Verify that required lubrication has taken place prior to any equipment start-up.

1.11 EQUIPMENT START-UP

A. Verify proper installation by manufacturer or his representative.

B. Advise General Contractor 2 days prior to actual start-up.

C. Verify proper operation. Obtain signed statement by manufacturer or his representative that equipment is operating within warranty requirements. Submit statement to General Contractor.

D. Perform field mechanical balancing in accordance with Section 230950: TESTING AND BALANCING OF MECHANICAL SYSTEMS.

E. The Mechanical Contractor shall own as part of his work, the following:

Provide one (1) additional drive set, if necessary, to obtain final design balancing requirements. The Mechanical Contractor shall coordinate with Balancing Firm and equipment manufacturer for drive selection, including belts and pulleys.

1.12 OPERATION & MAINTENANCE INSTRUCTIONS

A. Properly and fully instruct Owner's personnel in the operation and maintenance of all systems and equipment.

1. Provide one (1) 4-hour session of training to School District/Owner’s Maintenance Staff.

B. Insure that the Owner's personnel are familiar with all operations to carry on required activities.

C. Such instruction shall be for each item of equipment and each system as a whole.

D. Provide report that instruction has taken place. Include in the report the equipment and/or systems instructed, date, contractor, Owner's personnel, vendor, and that a complete operating and maintenance manual has been reviewed.

E. Manual shall include all instructions on operation, maintenance, repair parts list, lubrication requirements, brochures, catalogue cuts, complete schedule of air filters for each unit type in Excel spreadsheet format, wiring diagrams, piping diagrams, control sequences, service requirements, names and addresses of vendors, suppliers and emergency contacts. Three manuals shall be provided.

F. Submit manuals for review prior to operating instruction period. Manuals shall be 8-1/2 x 11" with hard cover, suitably bound.

G. Provide to the Owner any special tools necessary for operation and routine maintenance of any of the equipment.

H. Upon completion of the project, the Mechanical Contractor shall provide a complete set of legible as-built drawings for the Owner.

1.13 TOOLS

A. All equipment furnished by the Mechanical Contractor which requires special tools or devices other than those normally available to the maintenance or operating staff shall be furnished in duplicate to the Owner, sufficiently marked, packed or boxed for staff usage. The tools provided shall be listed by the Mechanical Contractor identified as to their use or the equipment applicable in a written transmittal to the Owner.

1.14 CLEANING AND FINISHING

A. After equipment start-up and all operating tests have been made and the system pronounced satisfactory, each respective Contractor shall go over the entire project, clean all equipment, etc., installed by him and leave in a clean and working condition. Any surfaces found marred after this final cleaning shall be refinished or replaced by each Contractor at no cost to the Owner.

B. Provide for the safety and good condition of all materials and equipment until final acceptance by the Owner. Protect all materials and equipment from damage. Provide adequate and proper storage facilities during the progress of the work. Special care shall be taken to provide protection for bearings, open connections, pipe coils, pumps, compressors and similar equipment.

C. All fixtures, piping, finished surfaces and equipment shall have all grease, adhesive labels and foreign materials removed.

D. Clean-up: Remove from the premises, all unused material and debris resulting from the performance of work under this section.

1.15 FILTERS

A. Mechanical Contractor shall provide one (1) spare air filter for each filter return grille for Owner’s attic stock.

PART 2 – PRODUCTS

2.1 GENERAL

A. All material and equipment shall be new and of present day manufacture, and shall conform to accepted standards of the trade where such a standard has been established for the particular type of equipment or material.

B. Whenever equipment or material is referred to in the singular, such as "the fan", it shall be deemed to apply to as many such items as necessary to complete the work.

2.2 PRODUCT DELIVERY, STORAGE AND HANDLING

A. During loading, transporting and unloading exercise care to prevent damage to material.

B. Store all materials in dry enclosures or under protective coverings out of way of work progress.

C. Material shall not be allowed to be stored directly on ground.

D. Deliver in manufacturer's original cartons or on skids.

E. Handle and protect so as to prevent damage to product or any surrounding material.

2.3 WARRANTY

A. Wherever in the specification sections of this division, reference is made to a specific warranty period, this warranty shall be in addition to and not a limitation of other rights the Owner may have against the Mechanical Contractor under the contract documents.

PART 3 – EXECUTION

3.1 PROTECTION

A. Plug or cap open ends of piping systems, conduit and ductwork.

B. Stored materials shall be covered to prevent damage by inclement weather, sun, dust or moisture.

C. Protect all installed work until accepted in place by the Owner.

D. Plates, polished metal escutcheons, thermostats and other finished devices shall not be installed until masonry, tile, and painting operations are complete unless otherwise protected.

E. Protect all work from operations which may cause damage such as hauling, welding, soldering, painting, insulating and covering.

3.2 WORKMANSHIP

A. Install all work neat, trim and plumb with building lines.

B. Install work in spaces allocated.

C. Cutting and patching shall be performed by skilled tradesmen normally employed for the work involved.

D. This Contractor shall provide a complete weathertight seal to all new systems in the building including the necessary caulking, weather-stripping and insulation.

3.3 EQUIPMENT SETTING

B. Provide as a minimum, spring vibration isolation under any equipment 10 HP and over and rubber in shear vibration isolation on any equipment up to 10 HP. For further specifications and additional requirements, refer to other sections.

3.4 FASTENERS, HANGERS AND SUPPORTS

A. Provide all hangers and supports required to suspend, mount, or hang the work. Drilling into the roof deck is not permitted.

B. Provide all miscellaneous steel angles, channels, beams, clips, brackets and anchors necessary to hang or support the work. Provide submissions for review.

C. Drilled inserts shall not be loaded more than 1/4 rated capacity.

D. Power-driven fasteners shall not be allowed for piping larger than 2 inch, or equipment. When used they shall not be loaded more than 1/8 rated capacity or 200 pounds.

E. All hangers, miscellaneous steel, braces and supports shall be galvanized, cadmium plated, or primed steel. Copper tubing shall be supported with copper hangers.

F. Piping shall be supported from adjustable clevis type hangers with insulation pipe saddles or pipe shields. Where hangers are 18" or longer provide lateral bracing at every fourth hanger.

G. Any lintels required for openings for this work if not indicated on Architectural or Structural drawings shall be provided under this Section.

3.5 SLEEVES

A. Provide each pipe, duct or conduit passing through a masonry or concrete wall, floor or partition with a sleeve made from standard weight steel pipe for pipe or conduit and No. 12 gauge galvanized steel for ducts, with smooth edges, securely and neatly cemented in place. Provide each pipe, duct or conduit passing through a frame or metal partition with a sleeve made from No. 22 gauge galvanized sheet metal, securely fastened in place.

B. Be responsible for the proper location and alignment of all sleeves.

C. Install both piping and sleeve seals so as to maintain integrity of seals with expansion and contraction of piping.

D. Extend wall and partition sleeves through and cut flush with each surface unless otherwise indicated or specified.

E. Select sleeves two pipe sizes larger than any pipe or conduit that is to remain uncovered, unless otherwise required by the sealing method specified. Where pipes are to be covered, provide sleeves large enough to allow the covering to pass through the sleeves with sufficient clearance for sealing as specified hereinafter.

F. Seal sleeves for pipes or conduit passing through ceiling air plenum walls or the floor above air tight.

3.6 OFFSETS, TRANSITIONS, MODIFICATIONS

A. Provide all offsets necessary to install the work and to provide clearance for other trades.

B. Maintain adequate headroom and clearance.

C. Incidental modifications necessary to the installation of the systems shall be made as necessary and as approved by the Architect.

3.7 RECESSES

A. Furnish information to the General Contractor as to sizes and locations of recesses required to install panels, boxes, and other equipment or devices which are to be recessed in walls.

B. Make offsets or modifications as required to suit final locations.

3.8 LABELING

A. All HVAC equipment such as air handling units, and devices requiring identification for operating procedures shall be provided with permanent black laminated micarta white core labels with 3/8 inch letters.

B. This shall also apply to all controllers, remote start/stop pushbuttons and equipment cabinets.

3.9 FLASHING AND COUNTERFLASHING

A. Roof curbs, etc., shall have counterflashing fittings. General Contractor shall provide flashing.

B. Piping and conduit thru the roof shall be flashed by the General Contractor. Provide counterflashing.

C. Provide curbs with base features required to match roof materials, finishes and configuration; e.g., flat, sloped, raised seam, etc.

3.10 ACCESS

A. Locate all equipment, valves, devices and controllers which may need service in accessible places.

B. Where access is not available, access panels shall be provided. Furnish access panels to the General Contractor for installation.

C. Access panels shall be Nailor-Hart Industries, Karp Co., or Controlled Air Manufacturing Limited, with 16 gauge frames and 14 gauge steel door, prime painted.

D. Maintain access clearances for tube or fan removal, coil pulls, and filter removal.

3.11 WIRING AND MOTOR CONTROLS

A. Packaged equipment shall be furnished with disconnect switches, starters, overloads, factory furnished and wired by the unit manufacturer.

B. Rooftop equipment shall be furnished with starters, disconnect switches, overloads, factory furnished and wired by unit manufacturer.

C. This Contractor shall furnish all information and assistance required for the Electrical Contractor to purchase all motor starters that are not specified to be part of the mechanical equipment.

D. Control wiring shall be provided under this Division of the work.

E. All wiring shall be in accordance with the National Electrical Code and as recommended by the equipment manufacturer.

3.12 UTILITIES

A. Do not interrupt any utility or service to the Owner without adequate previous notice and schedule.

3.13 PAINTING

A. The General Contractor shall be responsible for painting.

3.14 GUARANTEE

A. All work shall be guaranteed to be free from defects for a period of two years of operation from date of acceptance by the Owner.

B. Guarantee shall be extended on an equal time basis for all non-operational periods due to failure within the guarantee period.

C. All materials and equipment provided and/or installed under this section of the specifications shall be guaranteed for a period of two years from date of acceptance of the work by the Owner unless otherwise specified in Division 1. Should any trouble develop during this period due to defective materials or faulty workmanship, the Mechanical Contractor shall furnish necessary labor and materials to correct the trouble without any cost to the Owner. Any defective materials or inferior workmanship noticed at time of installation and/or during the guarantee period shall be corrected immediately to the entire satisfaction of the Owner.

D. In the event of occupancy by the Owner prior to final acceptance of the project, the guarantee date for equipment placed in operation shall be mutually agreed to by the Mechanical Contractor and the Owner's representative.

3.15 DRAWINGS

A. The Mechanical Systems are indicated on the Contract Drawings. Certain pertinent information and details required by the Mechanical Work appear on the Architectural, Structural and Electrical Drawings; become familiar with all drawings, and incorporate all pertinent requirements.

B. Drawings are diagrammatic and indicate the general arrangement of systems and requirements of the work. Do not scale drawings. Exact locations of fixtures and equipment, not specifically shown, shall be obtained before starting work.

3.16 TESTING AND BALANCING OF MECHANICAL EQUIPMENT

A. Perform field mechanical balancing in accordance with Section 230950: TESTING AND BALANCING OF MECHANICAL SYSTEMS.

B. The Mechanical Contractor shall own as part of his work, the following:

Provide one (1) additional drive set, if necessary, to obtain final design balancing requirements. The Mechanical Contractor shall coordinate with Balancing Firm and equipment manufacturer for drive selection, including belts and pulleys.

END OF SECTION 23 02 00

SECTION 23 02 10

BASIC MATERIALS AND METHODS – HVAC

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the work specified in this section.

B. Refer to Section 230200 for HVAC General Provisions.

C. Refer to other sections in Division 23 for materials and methods not specified herein.

1.2 DESCRIPTION OF WORK

A. Included in this Section are the following:

1. Copper Tubing & Fittings
2. Polyvinyl Chloride (PVC) Pipe and Fittings
3. Unions
4. Motors

1.3 REFERENCE STANDARDS

A. Refer to Section 230200 for a general description of requirements applying to this section.

B. Install work to meet the requirements of the following:

1. New Castle County Dept. of License and Inspections
2. International Mechanical Code
3. NFPA
4. OSHA
5. ASHRAE
6. Manufacturer's Standardization Society (MSS) of the valve and Fittings Industry, Inc.:

SP-58 Pipe Hangers and Supports Materials, Design and Manufacture.

SP-69 Pipe Hangers and Supports Selection and Application

C. Appliances and materials governed by UL requirements shall meet such requirements and bear the label.

1.4 QUALITY ASSURANCE

A. Provide adequate supervision of labor force to assure that all aspects of the specifications are being fulfilled.

B. Verify that all work and equipment is installed in accordance with manufacturer's warranty requirements.

PART 2 – PRODUCTS

2.1 COPPER TUBING & FITTINGS

A. Refrigeration Piping:

1. Copper tubing: Type ACR, hard drawn temper.

2. Fitting: Wrought-copper, solder joints, ASME B16.22 or ASME B16.26.

3. Joints: Brazed, American Welding Society (AWS) Class BCUP-5 for brazing filler metal.

B. Condensate Drain Piping:

1. Pipe: Copper tubing Type DWV.

2. Fittings: Wrought copper solder type drainage fittings, ASME B16.23 or B16.29.

2.2 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

A. Pipe:

1. ASTM D-1785 Schedule 40, Type 1, Grade 1.

B. Fittings:

1. ASTM D-2466 Schedule 40.

C. Solvent Cement: ASTM D-2564 Schedule 40.

D. Uniformity: To insure installation uniformity, all piping components shall be of one manufacturer.

E. Flux shall be non-toxic type and non-corrosive.

2.3 UNIONS

A. Copper tubing unions shall have sweated type ends. Flanged unions on copper tubing may be soldered connections.

B. Materials and pressure ratings shall be the same as specified for the respective pipe and fitting system unless otherwise specified.

2.4 MOTORS

A. All single phase and polyphase motors shall be manufactured to incorporate the latest NEMA standards.

B. All single phase and polyphase motors shall have steel frames with ball bearings and copper windings. All motors to have a Class "F" insulation system with a service factor of 1.15.

C. All motors shall be 1725 RPM, 4 pole design, unless otherwise noted on the drawings, or in the equipment specifications.

D. Motors installed indoors and not exposed to moisture shall be open, dripproof, Class B temperature rise based on 40 deg. C maximum ambient temperature.

E. Motors installed outdoors and exposed to moisture shall be totally enclosed, fan cooled, Class B temperature rise based on 40 deg. C maximum ambient temperature.

F. Based on NEMA Standards, motors shall comply with the following minimum nominal efficiencies at full load.

Nominal Efficiencies for "NEMA Premium ™" Induction Motors Rated 600 Volts or Less (Random Wound)						
	Open Drip-Proof			**Totally Enclosed Fan-Cooled**		
HP	**3500 RPM**	**1800 RPM**	**1200 RPM**	**3500 RPM**	**1800 RPM**	**1200 RPM**
1	**82.5**	**85.5**	**77.0**	**82.5**	**85.5**	**77.0**
1.5	**86.5**	**86.5**	**84.0**	**87.5**	**86.5**	**84.0**
2	**87.5**	**86.5**	**85.5**	**88.5**	**86.5**	**85.5**
3	**88.5**	**89.5**	**85.5**	**89.5**	**89.5**	**86.5**
5	**89.5**	**89.5**	**86.5**	**89.5**	**89.5**	**88.5**

G. Motor Characteristics: Refer to Equipment Schedules for specific data.

120/208 Volt System: Motors 1/2HP & Larger - 208V, 3 Phase, 3 Wire

Motors Less than 1/2HP- 120V, 1 Phase, 2 Wire

H. All motors rated less than 1/2HP shall have thermal protection of the auto-reset type as an integral part of the motor.

I. All motors rated 1/2HP and larger shall have thermal protection provided by an external device.

J. Whenever a variable frequency PWM drive is installed to control an AC motor, a maintenance-free, circumferential, conductive micro fiber shaft grounding ring shall be installed on the AC motor drive end to discharge shaft currents to ground. Recommended part: AEGIS SGR™ Bearing Protection Ring, as made by Electro Static Technology. Install in accordance with the manufacturer's written instructions.

PART 3 – EXECUTION

3.1 PIPING SYSTEMS

A. All piping to drain to low points.

B. Do not install trapped lines where water cannot be drained or air can accumulate without being vented.

C. Piping shall run square with building lines.

D. Piping shall not be insulated or covered until tested.

E. Necessary drains, off-sets, vents and drips shall be provided for coordination of the work as part of the contract.

F. Running or close nipples are not permitted.

G. Piping shall not be installed over electrical transformers, panels, switchgear, substations, and control panels. No piping shall be installed in elevator machine rooms.

H. Allow clearance for expansion and contraction.

I. Install eccentric piping fittings where change in sizes occurs in piping systems.

J. Install isolating fittings between sections of ferrous and non-ferrous pipe or connected equipment.

K. Do not support piping from other piping, conduits or equipment.

L. Support piping from building structure with expansion bolts, rods, steel angles, or channels installed to meet existing or new building conditions.

M. Drilling into the roof deck is not permitted.

N. Strainers shall be installed on inlets of control valves, and where indicated on drawings.

O. Unions shall be provided adjacent to all valves, at equipment connections, and where necessary to facilitate dismantling of the piping system.

P. Material Requirements for Systems:

1. Refrigerant Piping: Type ACR hard copper.

3.2 TAGS, CHARTS AND IDENTIFICATION

A. See Paragraph "Labeling" in GENERAL PROVISIONS for equipment labeling.

B. Piping Identification: Identify piping with Seton "Setmark" or Brimar, semi-rigid plastic, wraparound pipe markers with flow arrows and conforming to ANSI A13.1. Locate marker at each valve, changes in direction, where pipes pass thru barriers and every 25' of horizontal runs. Lettering on background shall be in accordance with the following colors:

Legend		Background	Lettering
1.	Refrigerant Liquid	- Yellow	- Black
2.	Refrigerant Gas	- Yellow	- Black

C. Manufacturers: Seton “Setmark”, Brimar, B-Line MSI.

3.3 SOLDERING/BRAZING

A. Connections between copper tubing and copper fittings shall be made with the appropriate filler metal. Flux shall be non-corrosive type as recommended by the manufacturer of the filler metal, and conforming to AWS A5.8.

B. Tubing shall be cut square and then reamed and deburred. End of tubing and inside of fitting cup shall be cleaned with steel wool and the flux shall be applied to the clean surface before joining. After joining, the excess filler metal shall be wiped off while still plastic.

C. Silver brazing alloy shall be equal to Easy-Flo by Handy and Harmon or Sta-Brite silver solder and shall be used for joints in:

1. Air conditioning condensate drain piping

D. Where the silver brazing is performed in a confined non-ventilated space, a non-toxic, cadmium-free brazing alloy such as braze 560 by Handy & Harman shall be used.

E. Refrigerant piping shall be silver brazed using Harris Sil-Fos 15 or equivalent, with nitrogen purge.

F. Bring joint to solder temperature or brazing temperature in as short a time as possible.

G. Form continuous solder bead or brazing filler bead around entire circumference of joint.

H. Wipe excess solder from joint area while solder is still plastic.

END OF SECTION 23 02 10

SECTION 23 02 15

VALVES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the work specified in this section.

B. Refer to Section 230200 for HVAC General Provisions.

C. Refer to other sections in Division 23 for materials and methods not specified herein.

1.2 DESCRIPTION OF WORK

A. This Section includes the following:

1. Refrigerant Valves and Specialties

1.3 QUALITY ASSURANCE

A. Provide adequate supervision of labor force to assure that all aspects of the specifications are being fulfilled.

B. Verify that all work and equipment is installed in accordance with manufacturer's warranty requirements.

PART 2 – PRODUCTS

2.1 REFRIGERANT VALVES & SPECIALTIES

A. Service Valves:

1. Globe Shutoff Valves: Forged brass, packed, back seating, winged seal cap, 300 degrees F (149 degrees C) temperature rating, 500 psi working pressure.

2. Check Valves: Forged brass, accessible internal parts, soft synthetic seat, fully guided brass piston and stainless steel spring, 250 degrees F (121 degrees C) temperature rating, 500 psi working pressure.

3. Manufacturers:

Henry Valve Co.

Parker Hannifin Corp., Refrigeration & Air-Conditioning

Sporlan Valve Co.

B. Solenoid Valves:

1. 2-way Solenoid Valves: Forged brass, designed to conform to ARI 760, normally closed, teflon valve seat, NEMA 1 solenoid enclosure, 24-volt, 60 Hz., UL-listed, 1/2" conduit adapter, 250 degrees F (121 degrees C) temperature rating, 400 psi working pressure.

2. Manufacturers:

   Alco Controls Div., Emerson Electric Co.

   Automatic Switch Co.

   Sporland Valve Co.

C. Specialties:

1. Refrigerant Strainers: Brass shell and end connections, brazed joints, monel screen, 100 mesh, UL listed, 350 psi working pressure.

2. Moisture-Liquid Indicators: Forged brass, single port, removable cap, polished optical glass, solder connections, UL listed, 200 degrees F (93 degrees C) temperature rating, 500 psi working pressure.

3. Refrigerant Filter-Driers: Corrosion-resistant steel shell, steel flange ring and spring, wrought copper fittings, ductile iron cover plate with steel cap screws, replaceable filter-drier core, 500 psi working pressure.

4. Evaporator Pressure Regulators: Provide corrosion-resistant, spring loaded, stainless steel springs, pressure operated, evaporator pressure regulator, in size and working pressure indicated, with copper connections.

6. Manufacturers:

   Alco Controls Div., Emerson Electric Co.

   Henry Valve Co.

   Parker-Hannifin corp., Refrigeration & Air Conditioning Div.

   Sporlan Valve Co.

PART 3 – EXECUTION

3.1 PIPING SYSTEMS

A. Valve body construction shall match piping system material.

B. Install isolating fittings between sections of ferrous and non-ferrous pipe or connected equipment.

C. Valves shall be installed with stems above horizontal.

D. Valves shall be installed on all sides of equipment and control valves to allow isolation for repair.

E. Unions shall be provided adjacent to all valves, at equipment connections, and where necessary to facilitate dismantling of the piping system.

END OF SECTION 23 02 15

SECTION 23 02 30

INSULATION & COVERING – HVAC

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the contract, including the conditions of the contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the work specified in this section.

B. Refer to Section 230200 for HVAC General Provisions

C. Refer to Section 230210 for HVAC Basic Materials & Methods.

1.2 DESCRIPTION OF WORK

A. Included in this section are the following:

1. Pipe Insulation Material
2. Duct Insulation
3. Acoustic Duct Liner

B. This Section includes insulation and covering provided on the following piping and equipment:

1. Condensate Drain Lines
2. Refrigerant Piping.
3. Exterior Piping
4. Acoustic Duct Liner

C. Insulation shall be installed on the following duct systems:

1. All supply ductwork.
2. All return ductwork.
3. All outside air intake ductwork.

1.3 REFERENCE STANDARDS

A. Refer to Section 230200 for a general description of requirements applying to this section.

1.4 QUALITY ASSURANCE

A. Refer to Section 230210 for a general description of requirements applying to this section.

B. Install insulation in accordance with manufacturer's recommendations.

C. Provide adequate supervision of labor force to assure that all aspects of the specifications are being fulfilled.

1.5 SUBMITTALS

A. Submit shop drawings, installation instructions, and manufacturer's literature of all materials specified in accordance with Section 230200.

B. Submit fabrication instructions for pipe fitting and valve insulation.

C. Submit manufacturer's joining recommendations for butt joints and longitudinal seams.

1.6 WARRANTY/GUARANTEE

A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, General Requirements.

PART 2 – PRODUCTS

2.1 PIPE INSULATION MATERIAL

A. Closed Cell:

1. Material: Black flexible elastomeric foamed closed cell structure insulation 25/50 rated with a flame spread rating of 25 or less and a smoke developed rating of 50 or less with both a moisture seal and a reinforced elastic foam lap seal closure system.

2. Flexible pipe insulation shall be a foamed elastomeric closed cell structure material, with a thermal conductivity of not more than 0.27 Btu/Hr./Sq. Ft./Inch at a mean temperature of 75 degrees F. The insulation shall have an average density of at least 2 pounds per cubic foot, shall be self-extinguishing, and shall have a water vapor transmission rating of not more than 0.1 perms. Between temperature limits of -40 degrees F and plus 220 degrees F, the insulation shall not indicate any deviation from its original state.

3. Specification Compliance:

   ASTM-E-84

   ASTM-C-534 Type I – Tubular, Type II – Sheet.

   ASTM-D-1056, 2B1 – Tubular, Sheet.

   MIL-C-3133B (MIL STD 670B) Grade SBE-3

   MIL-P-15S280J, Form T, Form S.

4. Manufacturers: Armacell, Nomaco, K-Flex, Aeroflex USA, Inc.

B. Covering of Pipe Insulation Outdoors:

1. Wrapping: Wrap insulation with embossed 0.016" aluminum jacket.

2. Fastenings: Cover shall be held in place with soft aluminum bands on 12" centers.

3. Valves and Fittings: Weatherproof all valves and fittings.

C. Manufacturers: Johns Manville Corp.., Certain-Teed, Owens- Corning, Knauf.

2.2 DUCT INSULATION

A. Concealed Supply, Return, and Outside Air Ductwork: Fiberglass duct wrap bonded with resins, 3/4-pound density, aluminum foil facing reinforced with fiberglass scrim, laminated to Kraft, 2" thick.

1. Thermal Conductivity: 0.27 Btu/Hr./SF/Inch at 75 degrees F. Min. installed "R" value shall be 6.0 and have a min. 25% compression of 5.6.

B. Exposed supply, return, and outside air ductwork, shall be insulated in finished conditioned spaces, penthouse, mechanical rooms, mezzanine areas, equipment closets, and non-conditioned spaces with 2" thick rigid fiberglass board. Insulation shall be 6 P.C.F. density with a "K" value of 0.25 Btu/Hr./SF/Inch at 75 degrees F. mean temperature and shall be U.L. listed at 25 maximum for flame spread, and 50 maximum for smoke developed. Insulation shall be applied using Graham Pins or Stik-Clips and all seams, edges and breaks shall be sealed with 4” matching tape and sealed with Vicryl CP-10 to match ASJ jacket. Insulation shall be provided with all-service jacket facing.

C. Manufacturers: Johns Manville Corp., Certain-Teed or Owens- Corning, Knauf.

D. Outdoor Installation:

1. Pre-manufactured panel system consisting of four (4) piece interlocking panels.

2. The interlocking panels shall be constructed of Dow Thermax Polyisocyanurate insulation, ASTM D-1622, nominal 2 pcf; water vapor transmission as permeance less than 0.03, per ASTM E-96; water absorption less than 0.3% (24 hours), per ASTM C-209; flexure strength more than 40 psi, per ASTM C-203.

3. Operating temperature range of -100°F to +250°F.

4. Insulation shall be laminated in two (2) layers to provide R-16 at 2” thickness, per ASTM C-236/C-518.

5. The insulation shall be jacketed with 0.032” thick embossed aluminum and sealed with vapor barrier compound. All joints shall interlock to ensure a thermal seal.

6. Panels shall be secured with #10 self-tapping stainless screws with weather seal washers.

7. Manufacturers: Techna-Duc Insulation System as made by P.T.M. Manufacturing, L.L.C., Newark, Delaware.

OR

D. Outdoor Installation:

1. Pre-manufactured exterior duct weatherization and insulation system with a 20 year warranty.

2. Insulation material shall be 2 inch thick, nominal 2 PCF density with a “K” value of 0.16 Btu/Hr/SF/Inch at 75 degrees F mean temperature, laminated polyisocyanurate foam insulation encased in 1.25 mil aluminum foil. Insulation shall be jacketed with a 0.032” thick embossed aluminum jacket. Jacket shall be secured using aluminum pop-rivets and approved caulk and/or sealant. Minimum installed “R” value shall be R-13

3. Provide duct roof pitch-supports (12 degree pitch) at all flanges, stiffeners, insulation joints along the top of the horizontal ducts with 24 inch maximum spacing.

4. Seams to be overlapped a minimum of 2 inches with a watershed application as per manufacturer’s design guidelines.

5. Foil tape used for sealing the insulation shall be a minimum thickness 2.0 mil pressure sensitive tape 4” FSK tape.

6. Manufacturer: Fabrite TM as made by County Insulation Group, or an approved equal using material and jacketing with a 20-year warranty.

    a. Approved equal shall be an insulation system constructed of glass-reinforced polyisocyanurate foam insulation encase in 1.25 mil aluminum foil vapor barrier facing. All insulation shall be a minimum thickness of 2 inch rigid or non-flexible board type, nominal 2.0 PCF density with a “K” value of 0.16 Btu/Hr/SF/Inch at 75 degrees F mean temperature. All seams shall be sealed with foil tape. Insulation shall be jacketed with a 0.032” thick embossed aluminum jacketing and adhered to insulation foil facing. Jacketing shall be overlapped and pitched to shed water to avoid standing water.

2.3 ACOUSTIC DUCT LINER

A. Duct liner shall be designed for use as an acoustical insulation to absorb air conditioning noise in sheet metal ducts and plenums operating at velocities up to 6000 fpm and temperatires up to 300 deg. F.

B. Material: Black fleixbile, closed-cell elastomeric insulation. Material shall be manufacturers without the use of CFCs, HFCs, or HCFCs. Also be formaldehyde-free, low VOCs, fiber free, duct free, and resist mold and mildew.

C. Liner shall comply with the requirements of NFPA 90A, NFPA 90B, and UL 181 Class 1 specifications. Surface burning characteristics shall comply with UL Standard 723 for 25/50 flame spread and smoke development.

D. Duct liner shall have a thermal conductivity of not more than 0.28 Btu/Hr/SqFt/Inch at a mean temperature of 75 degrees F. The insulation shall have a water vapor permeability rating of not more than 0.08 perm.in.

E. Duct liner shall be 2” thick with a min. R-8 value, unless noted on drawings.

F. Duct liner specifications compliance:

    ASTM-C-1071

ASTM-G-21

ASTM-C-1338

ASTM-G-22

ASTM-C-655

G. Manufacturers: Armacell ArmaFlex FS, K-Flex, Nomaco, Aeroflex USA, Inc.

PART 3 – EXECUTION

3.1 INSTALLATION – GENERAL

A. Do not install until systems have been tested and meet requirements.

B. Heavy work which may damage insulation shall have been completed in the vicinity of the insulation work.

C. Provide non-compressible insulation saddles at all piping hanger locations, and at all piping hanger locations where piping is insulated with flexible closed cell insulation.

Option: Provide insulation coupling system as made by Klo-Shure Co.

D. All installations shall be made by skilled craftsmen regularly engaged in this type of work.

E. Insulation shall be continuous thru-wall, ceiling and floors.

F. Metal shields, 16 gauge galvanized, shall be installed between hangers and pipe insulation.

G. Pipe, ductwork and equipment shall be clean and dry prior to insulating.

H. Install all insulation per manufacturer's instructions.

I. To avoid undue compression of insulation, provide solid core inserts at all supports as recommended by the insulation manufacturer. Provide insulation shields between the insulation jacket and the hanger.

J. Ductwork treated with internal acoustic duct liner does not require external insulation.

K. Apply vapor proof mastic as recommended by the insulation manufacturer on all longitudinal and butt joints of sectional pipe insulation. Apply similar mastic to the end of every third length of sectional pipe insulation on all chilled water and dual temperature pipe insulation to prevent the migration of condensation that might occur.

L. Provide insulation on all piping, equipment, and fixtures that are part of a factory assembly package not otherwise insulated by the manufacture of such packaged equipment. Insulation type and thickness shall comply with all of the requirements of this section.

3.2 PIPE INSULATION – TYPES & THICKNESSES

A. Provide flexible closed cell insulation of thickness specified on:

1. Refrigerant Piping: Exterior Locations for suction lines and hot gas bypass lines, if applicable. (NOTE: Insulate liquid line if metering device is mounted at the condensing unit.)

   a. Low Pressure Gas Line:

      1" for piping less than 1”

   b. High Pressure Gas Line (141˚F to 200˚F):

      1-1/2" for piping less than 1-1/2”

   c. Liquid Line (Hot Gas Bypass):

      1” for piping less than 1-1/2”

2. ½” thickness for condensate drain lines.

3.3 PIPE COVERING (FOAMED PLASTIC TYPE)

A. All joints and seams shall be sealed with a compatible adhesive. Approved adhesives are as follows:

Armstrong World Industries No. 520

Benjamin Foster Company No. 85-75 up to 200 degrees F.

Contractor may use Armstrong Self-Seal Armaflex 2000 insulation in lieu of the above wherever 1/2" is specified.

B. Fitting covers shall be fabricated from the foamed plastic pipe insulation or from sheet insulation of the identical material. The fabrication shall be in accordance with manufacturer's instructions, and all seams mitered joints shall be joined using the adhesives described hereinbefore.

C. Pipe insulation in concealed spaces shall require no finish coatings.

D. Pipe insulation in all other areas shall receive two coats of finish of color selected by Architect. Approved finishes are as follows:

Armstrong World Industries WB Armaflex Finish

3.4 EXTERIOR PIPE COVERING

A. Wrapping: Wrap insulation with embossed 0.016" aluminum jacket, orient seam down.

B. Fastenings: Cover shall be held in place with soft aluminum bands on 12" centers.

C. Valves and Fittings:

1. Weatherproof all valves and fittings.

2. Finish: Apply two coats of vapor resistant mastic reinforced with glass fabric over wrapping.

3.5 ACOUSTIC DUCT LINER

A. All portions of duct designated on the drawings to receive duct liner shall be completely covered with duct liner, adhered to the sheet metal with a 100% coverage of adhesive complying with ASTM C916.

B. Transverse joints shall be neatly butted and there shall be no interruptions or gaps. All transverse joints and all exposed leading edges shall be coated. The black coated surface of the duct liner shall face the airstream.

C. Duct liner shall be secured with mechanical fasteners which shall compress the duct liner sufficiently to hold it firmly in place.

D. Duct liner shall be cut to assure overlapped and compressed longitudinal joints.

E. After installation is complete, blow out the duct system prior to operation to remove any cutting scraps and foreign material remaining in the duct.

END OF SECTION 23 02 30

SECTION 23 04 50

REFRIGERATION EQUIPMENT – HVAC

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the contract, including the conditions of the contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the work specified in this section.

B. Refer to Section 230200 for HVAC General Provisions

C. Refer to Section 230210 for HVAC Basic Materials & Methods.

1.2 DESCRIPTION OF WORK

A. This Section includes labor, material, equipment and supervision to for the following:

1. Split System Heat Pump Units

1.3 REFERENCE STANDARDS

A. Refer to Section 230200 for a general description of requirements applying to this section.

B. Comply with applicable provisions of:

1. International Mechanical Code
2. ASME Codes for Pressure Vessels
3. A.R.I. Capacity Ratings
4. NFPA Pamphlets
5. ASHRAE Standard 15
6. ASHRAE Standard 90.1, Section 6, Table 6.8.1A thru J, minimum equipment efficiency.

1.4 QUALITY ASSURANCE

A. Refer to Section 230210 for a general description of requirements applying to this Section.

B. Whenever a variable frequency PWM drive is installed to control an AC motor, a maintenance-free, circumferential, conductive micro fiber shaft grounding ring shall be installed on the AC motor drive end to discharge shaft currents to ground. Recommended part: AEGIS SGR™ Bearing Protection Ring, as made by Electro Static Technology. Install in accordance with the manufacturer's written instructions.

1.5 SUBMITTALS

A. Submit shop drawings and product data in accordance with Section 230200.

B. Submit the following:

1. Shop drawings and product data for all equipment in this section.

1.6 SUBSTITUTIONS

A. The listed equivalent or substituted manufacturers along with the bidding related contractor shall be completely responsible to comply with all requirements on all contract documents. This shall include, but not be limited to, space requirements, code clearances, the type, horsepower, capacities, number and size of services required from other trades, including all required ancillary items furnished and installed by other trades. If the manufacturer or related bidding contractor does not comply with these requirements, this Contractor shall be responsible for any and all additional costs associated with the changes required by other trades.

1.7 WARRANTY/GUARANTEE

A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, General Requirements. In addition, the following special guarantee applies:

1. Manufacturer shall guarantee all refrigeration equipment including parts and labor, for five (5) years from start-up.

PART 2 – PRODUCTS

2.1 SPLIT SYSTEM HEAT PUMP UNIT

A. Air conditioning system shall be a variable capacity (cool/heat) split system heat pump. The system shall consist of a packaged evaporator section and matching outdoor air-cooled condensing unit. The units shall be listed by and bear the ETL label. All wiring should be in accordance with the National Electrical Code (N.E.C.). The units shall be rated in accordance with ARI Standard 240 and bear the ARI label. A full charge of R-410A refrigerant for 25 feet of refrigerant tubing shall be provided in the condensing unit. Additional refrigerant may be required based on lengths of refrigerant lines. A dry nitrogen holding charge shall be provided in the evaporator. System SEER shall meet or exceed 2021 IECC ratings.

B. High Static (Ceiling-Concealed Ducted) Indoor Unit:

1. The indoor unit shall be a high-performance, high static pressure capable, concealed ducted indoor fan coil that mounts above the ceiling with a fixed horizontal discharge supply and shall have a modulating expansion device (gear type).

2. The indoor unit shall be factory assembled, wired, and run tested. Contained within the unit shall be all factory wiring, piping, control circuit board, and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function.

3. The indoor unit shall have an integral condensate pump as standard with 29” maximum lift from the bottom of the indoor unit.

4. The indoor unit shall have an integral condensate float switch to disable the unit in the even of condensate overflow.

5. The cabinet shall be constructed of insulated galvanized steel.

6. The indoor unit fan shall be an assembly with two or three fans, direct driven by one (1) fan motor.

7. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.

8. The indoor unit shall have a ducted air outlet system and ducted return air system.

9. The fan speed shall be adjustable by optional remote controller of manufacturer provided service software according to external static pressure.

10. The indoor coil shall be on nonferrous construction with slit fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phos-copper or silver alloy.

11. The unit electrical power shall be 208/230 volts, 1 phase, 60 hertz supplied from the remote condensing unit.

C. Condensing Unit:

1. Unit shall be equipped with multiple circuit boards to perform all functions of operation.

2. Both refrigerant lines from condensing unit to indoor evaporator shall be insulated.

3. Unit shall have a high-pressure safety switch, fuse, over-current protection, over-voltage protection, temperature limit protection logic, compressor overload sensing, and crank case heater.

4. Unit shall be capable of operating in outside ambient temperature between 0 deg. F to 115 deg. F in cooling mode with optional wind baffles.

5. The chassis shall be fabricated of galvanized steel, finished with a powder coated baked enamel.

6. Unit shall be furnished with a direct drive, variable speed propeller type fan.

7. Unit shall contain a single electronic expansion valve to control refrigerant flow.

8. The electrical power shall be 208/230 volts, 1 phase, 60 hertz.

D. Controls: The control system shall be microprocessor based. The wall mounted controller shall provide a continuous display of operation status and condition. Controller shall control On/Off, operation mode (auto, cool, heat, dry, and fan), temperature setpoint, fan speed setting, and On/Off timer.

1. The auto restart feature shall automatically restart after a power failure.

E. Factory installed controls shall include connections for 24-volt, hard-wired, wall-mounted thermostat,

control board featuring anti-short cycle timer, 60 second post purge fan relay, and relays and connectors for condensing unit control. Provide wall-mounted solid state thermostat for field mounting and wiring to the indoor unit; the thermostat shall be capable of one-stage cooling; one-stage cooling, one-stage heating with manual changeover; one-stage cooling, two-stage heating with heat pump operation for the first stage of heat, as scheduled on the drawings.

F. Manufacturers: Daikin McQuay, Mitsubishi Electric, Trane, Samsung.

1. Any listed equivalent manufacturer and the Mechanical Contractor shall be completely responsible to comply with all requirements on the contract documents. This shall include, but not be limited to, space requirements, code clearances, the type, horsepower, capacities, number and size of services required from other trades.

G. Sequence of Operations

1. Interface heat pump unit with its wall mounted temperature control, as furnished with unit.

2. The thermostat shall activate the heat pump unit according to its programmed occupied/unoccupied schedule. Ser to maintain occupied space temperature at 70˚F, adjustable, in the heating mode, and the 75˚F, adjustable, in the cooling mode. Program unoccupied setpoints as directed by the Owner.

3. Provide a motor operated damper and actuator in the outside air duct. Interface damper operation with the room thermostat. Damper shall open fully during the occupied mode and remain closed during the unoccupied mode.

4. Provide a water sensor in the bottom of the auxiliary drain pan located under the unit. Upon sensing water in the pan, the unit shall be de-energized.

PART 3 – EXECUTION

3.1 SPLIT SYSTEM HEAT PUMPS

A. Install split system units in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

B. Electrical Wiring: Install electrical devices furnished by manufacturer but not specified to be factory mounted.

1. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements. Do not proceed with equipment start-up until wiring installation is acceptable.

END OF SECTION 23 04 50

SECTION 23 06 00

AIR DISTRIBUTION & ACCESSORIES – HVAC

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the contract, including the conditions of the contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the work specified in this section.

B. Refer to Section 230200 for HVAC General Provisions

C. Refer to Section 230210 for HVAC Basic Materials & Methods.

D. This Contractor shall coordinate with the work of Division 26 and the Fire Alarm System vendor for locations and mounting of all duct smoke detectors. These devices are shown on the Mechanical Drawings for reference only to show the intent of the work. All locations shall be determined based on approved shop drawings from the Fire Alarm System vendor and the Contractor for the work of Division 26, Electrical. Mount smoke detectors in the supply and return air stream at each unit in accordance with NFPA 72.

1.2 DESCRIPTION OF WORK

A. This Section includes labor, material, equipment and supervision to provide a complete air distribution system as specified herein and as shown on drawings.

1. Ductwork – Single Wall, Square and Rectangular
2. Ductwork - Single Wall, Spiral Round
3. Flexible Air Duct
4. Flexible Connections
5. Dampers
6. Air Diffusers, Registers and Grilles
7. Prefabricated Roof Curbs and Equipment Supports
8. Roof Mounted Intake Hood

1.3 REFERENCE STANDARDS

A. Refer to Section 230200 for a general description of requirements applying to this section.

B. Requirements established within the portions of the Project Manual titled Division 1, General Requirements, are collectively applicable to the work of this section.

C. IMC (International Mechanical Code).

D. SMACNA (Sheet Metal and Air Conditioning Contractors National Association, Inc.)

E. American Society of Heating, Refrigerating and Air Conditioning Engineers' recommendations in ASHRAE Guide shall apply to this work.

F. ARI Standard 885 - Standard for Estimating Occupied Sound Levels in the Applications of Air Terminals and Air Outlets.

G. UL (Underwriter's Laboratories, Inc.)

H. NFPA 90A shall apply to this work.

I. State Fire Prevention Regulations.

1.4 QUALITY ASSURANCE

A. Refer to Section 230210 for a general description of requirements applying to this Section.

1.5 SUBMITTALS

A. Submit shop drawings and product data in accordance with Section 230200.

B. Submit the following:

1. Shop drawings of all sheet metal. Indicate all steel, piping, conduit, and Architectural/Structural features to demonstrate complete coordination. Scale shall not be less than ¼".

   a. Shop drawings shall indicate the sizes and lengths of each section of ductwork as well as all system components such as dampers, diffusers and register locations. Also indicate the type of joints used and where internal acoustic lining or insulation, if required, will be utilized.

   b. The location of the duct runs and the air outlets shall be closely coordinated with all other trades by the sheet metal contractor to avoid interference. The shop drawings shall show the contact surfaces adjacent to the ducts or air outlets and the space assigned for concealment. The drawings shall indicate principal items of equipment, adjacent piping and conduit, etc., the location of which shall be secured from the contractors of other trades.

   c. Sheet Metal Contractor to include resubmissions of the shop drawings to the Engineer. The resubmissions are to include all corrections to previous submissions.

2. Manufacturer's literature and performance data of all equipment and devices.

3. Samples: Furnish color samples, etc., at request of the Architect.

1.6 SUBSTITUTIONS

A. The listed equivalent or substituted manufacturers along with the bidding related contractor shall be completely responsible to comply with all requirements on all contract documents. This shall include, but shall not be limited to space requirements, code clearances, the type, horsepower,

capacities, number and size of services required from other trades, including all required ancillary items furnished and installed by other trades. If the manufacturer or related bidding contractor does not comply with these requirements, they shall be responsible for any and all additional costs associated with the changes required by other trades.

1.7 WARRANTY GUARANTEE

A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, General Requirements.

PART 2 – PRODUCTS

2.1 DUCTWORK (SINGLE WALL, SQUARE AND RECTANGULAR)

A. All ductwork shall be fabricated in accordance with SMACNA "HVAC Duct Construction Standards - Metal and Flexible" latest Edition except as described below. The minimum thickness of metal ductwork is 26 gauge. Fabrication requirements shall be based on ductwork subjected to positive or negative pressures of 3” W.G. Ductwork systems shall be sealed to SMACNA "Seal Class “B” Standards. Alternatively, "Ductmate" System 45 can be used in accordance with manufacturer's specifications. Drive slip joints are not permitted.

Exception: For ductwork smaller than 12” x 8”, Contractor may provide slip and drive joints with all joints sealed with Hardcast tape and mastic system.

B. Rectangular ducts for 3” W.G. or less, positive or negative pressure shall be per SMACNA Table 1-6. Longitudinal seams shall be Pittsburgh Lock Type L-l per SMACNA Figure 1-5. Transverse joints shall be standing seam type T -15 per Figure 1-4.

1. In the event that material size is not compatible with duct size and segmenting must be utilized to fabricate duct, use SMACNA Figure 1-5, seam L-4 (Standing Seam).

C. Joints:

1. Per SMACNA Transverse Joint Reinforcement Table 1-12, only joints T -22, T -25a, T -25b and Proprietary slip on flanges will be acceptable.

2. Joints T -25a and T -25b that have stress fractures from bending will not be accepted.

3. All joints will have butyl gasket 3/16" thick by 5/8" wide installed per manufacturers installation instructions.

D. Ductwork systems for this standard shall be galvanized sheet steel, commercial quality of lock - forming grade, conforming to ASTM coating standards A-525 or A-527 with coating of designation G-60. For corrosive or moist conditions, use coating designation G-90.

E. The size and configuration of each duct shall be indicated on design drawings. Where thicker sheets or different types of materials are required, they shall be specified on the design drawings or in the project specifications.

F. Aluminum Rectangular Ductwork:

1. Aluminum ductwork shall be two B.& S. gauges heavier than specified for the equivalent width steel ductwork. Bracing, supports and joints shall be as specified for steel ductwork.

2. Aluminum ducts shall be used where the ducts are concealed when exhausting saturated air from dishwashing, showers, outside air intakes and similar designated spaces.

3. Dishwashing exhaust ducts shall be made watertight by means of silicone or 3M duct sealant properly installed and compressed at each joint and seam.

G. Kitchen exhaust duct shall have all joints, seams, penetrations and duct-to-hood collar connections with continuous, external, liquid-tight welds.

1. Carbon Steel: Fabricate from 16 gauge, ASTM-A569 hot rolled or ASTM-A366.

2. Stainless Steel: Fabricate from 18 gauge, Type 304, 2D finish.

3. Option: Factory fabricated grease duct system, U .L. listed, which meets all the requirements of NFPA 96.

2.2 DUCTWORK (SINGLE WALL, SPIRAL ROUND)

A. Design Pressure: 3”

B. Leakage: All ductwork shall meet SMACNA Class "A" leak standards.

C. Fabrication:

1. Gauges, reinforcing angles, seams, joints, fabrication methods, installation methods and practices, duct reinforcement, and devices installed in duct system, fittings, etc., shall conform to the latest editions of SMACNA standards for construction in accordance with requirements indicated in these specifications.

2. Minimum metal gauges shall be 26 gauge (.019). Follow SMACNA Table 3-5 for Positive pressure and Table 3-7 for Negative pressure.

D. Joints:

1. Duct up to 36" diameter - Male/Female beaded slip joint similar to SMACNA Figure 3-1, joint RT-1 or RT-5, as long as it meets the criteria for the system design pressure. Fittings shall be undersized to fit into spiral duct. All joints shall be secured with a minimum of 4 screws on each duct section (equally spaced). Seal joint with an approved sealant compound, continuously applied prior to assembly of joint and after fastening, making certain that the majority of the sealant resides on the interior of the joint.

2.3 FLEXIBLE AIR DUCT

A. Insulated flexible air duct shall be non-metallic. Air duct shall comply with the latest NFPA Bulletin No. 90A and be labeled as Class 1 Air Duct, U.L. Standard No. 181.

B. Air ducts shall be suitable for working pressure of not less than plus 10.0 and minus 0.5 inches of W.G.

C. Non-metallic air duct shall be two element spiral construction composed of a corrosion resisting metal supporting spiral and a vinyl coated fiberglass base fabric and shall be mechanically interlocked together.

D. Insulation shall be 1-1/2” thick fiberglass flexible blanket with vapor barrier outer jacket of polyethylene or reinforced mylar. Maximum thermal conductance of 0.23 Btu/Hr./SF/Inch at 75 deg. F temperature.

E. Flexible duct shall be no longer than 5’-0”.

F. Where flex elbow connections are made to diffusers, provide a flexible duct elbow support (durable elbow support). Support shall be a 1-piece, fully adjustable radius forming brace and be UL listed. Manufacturer shall be Thermaflex Flex-Flow, Titus Flex-Right, or approved equal.

G. Approved manufacturers shall include the Wiremold Company, Flexmaster USA, Owens-Corning, Thermaflex Flex Vent.

2.4 FLEXIBLE CONNECTIONS

A. Required between ductwork and suction and discharge connection of all air handlers and where shown on drawings.

B. Material: Woven fiberglass with mounting hardware tested in accordance with UL Standard 181, listed and labeled as Class 0 or 1.

C. Manufacturer: Ventfabrics, Inc., Durodyne, Dynair, Ductmate Pro Flex.

2.5 DAMPERS

A. Provide where indicated and required to control flow of air and balance system.

B. Round dampers shall be single blade, molded synthetic bearings at each end, 20 gauge galvanized steel, adjusting quadrant and locking device. Round dampers shall be Ruskin Model MDRS25.

C. Rectangular and square dampers shall be opposed blade within 16 gauge galvanized steel channel frame with corner brace, 16 gauge galvanized steel blades; molded synthetic bearings and hex steel shafts, exposed or concealed linkage, adjustable quadrant and locking device. Damper 10” and below shall be single-blade. Dampers shall be Ruskin Model MD35.

D. Approved Manufacturers: Ruskin, Arrow, Nailor-Hart, Pottorff, Lloyd Industries, Inc., Cesco Products, Louvers & Dampers, United Enertech.

2.6 AIR DIFFUSERS, REGISTERS AND GRILLES

A. Air diffusing terminals shall be provided in duct runs on drawings. The diffusers shall properly and uniformly distribute the design air quantity with no objectionable drafts, while maintaining not more than 50 F. P. M. velocity in the occupied portion of the space.

1. Square Louvered Diffuser Face:

a. Square housing, welded steel construction core of square concentric louvers, removable at face of diffuser, round duct connection, with borders suitable for lay-in ceiling tile application.

b. Diffuser Patterns: Fixed louver face for 1, 2, 3, or 4 direction air flow, direction indicated on drawings.

c. Finish: Matte white finish.

d. Manufacturers: Price Model SMD

2. Linear Diffusers:

a. Linear diffusers shall be horizontal continuous slot type with multiple slots per the schedule and drawings. Construction shall be extruded aluminum with 1/2", 3/4" or 1 " slots. The diffusers shall have integral devices to equalize air flow over the entire length of the diffuser.

b. Multiple sections of diffusers shall be installed in a continuous arrangement, the butt ends shall be provided without flanges to provide a continuous effect. Multiple sections shall be aligned and fastened with alignment pins and slots or a similar method.

c. Linear diffusers shall be provided with adjustable vanes to provide horizontal, vertical or midway patterns of air diffusion. Finish as selected by Architect.

d. Manufacturers: Price Model SDS.

C. Registers & Grilles:

1. Registers and grilles shall be steel construction, fixed single deflection type, with clips and/or flange holes and screws (as required by Architectural finishes) to secure registers to ceiling construction. Face bars shall be inclined 30 degrees. Registers and grilles shall be factory primed and painted with a baked-on white enamel finish.

2. Ceiling Return Grille (CR):

a. Ceiling grilles shall have a perforated face with 3/16-inch diameter holes on 1/4-inch staggered centers and no less than 51 percent free area. Perforated face shall be aluminum according to the model selected. The back pan shall be one piece stamped heavy gauge steel of the sizes and mounting types shown on the plans and outlet schedule.

b. The finish shall be #26 white. The finish shall be a baked on anodic acrylic paint, with a pencil hardness of HB to H. Inside of back pan shall be painted flat black.

c. Price Model PDDR

3. Ceiling Louvered Return Filter Grille (CR):

a. Return filter grilles shall be of size and mounting type as shown on the drawings and schedules.

b. Borders shall be constructed of steel with countersink holes or frame suitable for ceiling finish in each room.

c. The four corners shall be interlocked and mechanically staked to form a rigid frame.

d. Deflection blades shall be ½ inch spacing, 45° deflection.

e. Return grilles shall be provided with a filter frame that will accommodate a standard 1-inch thick disposable filter to fit the specified duct size. Filter shall be grille module size minus 4 inches. Filter capacity shall be as scheduled on the drawings.

f. Return grille finish shall be white powder coat.

g. Price Model 535FF

D. Manufacturers: Provide diffusers, registers and grilles of one of the following:

Krueger Price

Metalaire Titus

Tuttle & Bailey

2.7 PREFABRICATED ROOF CURBS AND EQUIPMENT SUPPORTS

A. Factory fabricated by the manufacturer of the respective roof-mounted equipment when available and capable of meeting the following requirements:

1. Thermally and acoustically insulated, rubber isolating pads.

2. Built to suit slope of roof and type of roofing; i.e. standing metal seam with integral cant strip and flashing extension.

3. 8” to 11” height unless otherwise indicated.

4. Support rails shall be aluminum, or sheet steel, with continuous wood nailer and removable counterflashing.

B. Curbs shall be a product of a custom manufacture in the following cases:

1. Curbs as specified are not available from the respective equipment manufacturer.

2. Piping or ducts penetrating roof.

3. Prefabricated equipment supports are required.

4. Step flashing assembly, EPDM for normal use and silicone for pipe temperatures above 200°F stainless steel clamp, suitable for single or multiple pipes.

C. Pipe supports shall be a product of a custom manufacture equal to Pipe Prop as made by JMB Industries, or Anvil International Haydon H-Block.

D. Manufacturers: Pate, Shipman, Custom Curb, Portals Plus, Lloyd Industries, Inc., PHP Systems/Design.

2.8 ROOF-MOUNTED INTAKE HOOD

A. Heavy gauge aluminum construction.

B. Hood underside insulated with 1" fiberglass.

C. Aluminum insect screen.

D. Provide 12-inch-high insulated roof curb with blocking to secure equipment, and integral cant to accommodate configuration of roofing material/membrane.

E. Manufacturers: Penn Ventilator Co., Carnes Co., Greenheck, or Loren-Cook.

PART 3 – EXECUTION

3.1 DUCTWORK

A. Dimensions on drawings are inside dimensions. Sheet metal dimensions shall be increased to suit thickness of acoustic duct lining, if applicable. Ductwork that is lined with acoustic lining is insulated.

B. Ducts shall be concealed unless otherwise indicated.

C. Changes in direction shall be made with radius bends or turning vanes.

D. Supports shall be galvanized steel for steel ductwork and aluminum for aluminum ductwork.

E. Locate ceiling air diffusers, registers, and grilles on "Reflected Ceiling Plans". Unless otherwise indicated, locate units in center of acoustical ceiling modules.

F. Do not install ductwork directly above any electrical equipment.

G. Ductwork shall be supported per SMACNA Standards including the following:

1. Rivet or screw to side and bottom of duct when using flat strap hangers. Rivet or screw to bottom of duct when using trapeze hangers.

2. Strap hangers shall pass under duct 1” minimum or shall loop around duct.

3. Space hangers not more than 8' on centers for ducts up to 18" wide and 4' on centers for ducts over 18" wide.

4. Wire/Cable hangers are not acceptable.

5. Support ductwork from building structure with expansion bolts, rods, steel angles or channels installed to meet existing or new building conditions.

6. Drilling into the roof deck is not permitted.

7. Driving nails into anchors is not permitted.

H. Air Flow Control:

1. Major take-offs: Install volume control dampers.

2. Branches: Install volume control dampers in all branches and at tap in branch take-off connections.

3. Elbows: Use unvaned elbows with throat radius equal to width of duct and full heel radius; provide turning vanes where full throat and heel radius are not possible.

4. Transitions: Make transitions in ducts as required by structural or architectural interferences.

a. Proportion airways to compensate for any obstructions within duct.

b. Avoid dead ends and abrupt angles.

c. Do not exceed 22-1/2 degrees slope on sides of transitions.

3.2 FLEXIBLE AIR DUCT

A. When flexible duct is used for final connection between duct mains on branches and diffusers on registers. The maximum length of flexible ductwork shall be 5'-0" in length.

B. Flexible ductwork shall be properly hung at the tap collar in order to prevent eventual wear and damage to the flexible duct.

C. The ceiling tile system should not be considered a support on which to lay flexible duct. Refer to SMACNA Standards for proper installation.

3.3 DUCT SYSTEM LEAK SEALING

A. Joints in duct systems shall be sealed to prevent air leakage.

B. All duct joints and seams in medium pressure and high-pressure duct systems shall be sealed to SMACNA Seal Class" A" Standards to prevent air leakage.

C. In the event there is in excess of 5% air leakage indicated in low pressure duct systems, it shall be the Contractors responsibility to seal the duct system. The amount of sealing necessary shall be that required to obtain the design air quantity at each terminal.

D. Duct sealing shall be by means of high velocity duct sealants such as Hardcast and/or Neoprene gaskets. Type of sealant and method of application shall conform to recommendations in SMACNA high velocity duct construction standards.

3.4 DUCTWORK TESTING

A. The following duct systems shall be pressure leak tested:

1. Supply ductwork

2. Return ductwork

B. Pressure leak test the following:

1. All ductwork within chases

2. 50% of all ducts

3. 100% of all equipment

C. All tests shall be conducted in accordance with AABC National Standards.

D. Ducts to be tested at 100% maximum of static pressure before any duct is insulated externally and concealed in accordance with SMACNA Standards.

E. Calculate the allowable leakage using leakage factor of 5% of Design Air Flow.

F. Select a limited section of duct for which the estimated leakage will not exceed capacity of the test apparatus.

G. Connect the blower and flow meter to the duct section and provide temporary seals at all openings of the ductwork.

H. Start the blower motor with the inlet damper closed. Increase pressure until the required level is reached.

I. Read the flow meter and compare the leakage in cfm. Reading should be 5% or less of design flow for the duct segment being tested.

J. If reading is more than 5% of design flow, depressurize duct, repair all leaks and retest until 5% or less of design flow is obtained.

K. Complete test reports and obtain Owner's witness signature.

L. Remove all temporary blanks and seals.

M. Warning: Do not overpressure duct.

3.5 EQUIPMENT

A. Test apparatus shall consist of an airflow measuring device, flow producing unit, pressure indicating devices and accessories necessary to connect the metering system to the test specimen.

B. The Contractor conducting tests shall arrange for or provide all temporary services, all test apparatus, all temporary seals and all qualified personnel necessary to conduct the specified testing.

C. Test apparatus shall be accurate within plus or minus 7.5% at the indicated flow rate and test pressure and shall have calibration data or a certificate signifying manufacture of the meter in conformance with the ASME Requirements for Fluid Meters. Verification of above, to be supplied to Owner upon request.

D. Pressure differential sensing instruments shall be readable to 0.05" scale division for flow rates below 10 cfm or below 0.5" w.g. differential. For flows greater than 10 cfm scale divisions of 0.1" are appropriate. U-tube manometers should not be used for reading less than 1" of water.

E. Liquid for manometers shall have a specific gravity of 1 (as water) unless the scale is calibrated to read in inches of water contingent on use of a liquid of another specific gravity, in which case the associated gauge fluid must be used.

F. Instruments must be adjusted to zero reading before pressure is applied.

3.6 TEST REPORT

A. Log the project and system identification data.

B. Enter the fan CFM, the test pressure, and the leakage class specified by the designer.

C. Enter an identification for each duct segment to be tested.

D. Calculate the allowable leakage factor. Enter this number on the report for each test segment.

E. Conduct and record the field tests. If the sum of the CFM measured is less than or equal to the sum of the allowable leakage, the test is passed. Record the date(s), presence of witnesses and flow meter characteristics.

F. Maintain a mechanical duct plan of all tested duct segments. Plan to include duct segment identification and dates tested.

G. Test reports shall be submitted as required by the project documents.

END OF SECTION 23 06 00

SECTION 23 07 60

AIR HANDLING EQUIPMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the contract, including the conditions of the contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the work specified in this section.

B. Refer to Section 230200 for HVAC General Provisions

C. Refer to Section 230210 for HVAC Basic Materials & Methods.

1.2 DESCRIPTION OF WORK

A. This Section includes work necessary and/or required and materials and equipment for construction of a complete system. Such work includes, but is not limited to the following:

1. Single Packaged, Gas-Fired Rooftop Air Conditioning Unit (Alternate #3)

1.3 REFERENCE STANDARDS

A. Refer to Section 230200 for a general description of requirements applying to this section.

B. AMCA Standards 210 and 300 for fans.

C. ARI Standard 410, ASHRAE Standard 33 for Heating and Cooling Coils.

D. ASHRAE Standard 52.2 and U.L. Standard 900 for media type air filters.

E. AMCA Standard 511 and 500D for Air Control Dampers.

F. ARI Standard 260 and 430 for Air Handling Units.

1.4 QUALITY ASSURANCE

A. Refer to Section 230210 for a general description of requirements applying to this Section.

B. Whenever a variable frequency PWM drive is installed to control an AC motor, a maintenance-free, circumferential, conductive micro fiber shaft grounding ring shall be installed on the AC motor drive end to discharge shaft currents to ground. Recommended part: AEGIS SGR™ Bearing Protection Ring, as made by Electro Static Technology. Install in accordance with the manufacturer's written instructions.

1.5 SUBMITTALS

A. Submit shop drawings in accordance with Section 230200.

B. Submit shop drawings and descriptive date for all equipment specified in this section.

1.6 SUBSTITUTIONS

A. The listed equivalent or substituted manufacturers along with the bidding related contractor shall be completely responsible to comply with all requirements on all contract documents. This shall include, but not limited to, space requirements, code clearances, the type, horsepower, capacities, number and size of services required from other trades, including all required ancillary items provided by other trades. If the manufacturer or related bidding contractor does not comply with these requirements, this Contractor shall be responsible for any and all additional costs associated with the changes required by other trades.

1.7 WARRANTY/GUARANTEE

A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, General Requirements. In addition, the following special guarantee applies:

1. Each compressor unit shall be provided with manufacturer's five (5) year parts and labor warranty.

PART 2 – PRODUCTS

2.1 SINGLE PACKAGED, GAS-FIRED ROOFTOP AIR CONDITIONING UNIT

A. Refrigeration System:

1. One independent refrigeration circuit with hermetic compressor, crankcase heater, strainer, high and low-pressure control, compressor motor protection, and access valves.

2. A direct expansion, draw-thru evaporator coil shall be circuited so that its entire fin surface will be active during part load operation.

3. Draw-thru condenser coils with a separate sub-cooling circuit for each refrigeration system shall provide at least 15 F of sub- cooling at design conditions.

4. Outdoor air thermostats shall cycle the condenser fan motors to maintain stable operation at ambient temperature down to 35 deg. F. Condenser fan motors shall have inherent protection.

B. 100% Outdoor Air (Economizer Package):

1. Outdoor and return air dampers shall be interlocked in position by a fully modulating damper actuator. Actuator shall be spring return so that the outdoor air intake dampers will close when power to the unit is interrupted. Dampers to be controlled by ATC.

2. Maximum leakage rate for the outdoor air intake dampers shall not exceed 2% when fully closed and operating against a pressure differential of 0.5” WC.

3. The outdoor intake opening shall be covered with a birdscreen and a rain-hood that matches the exterior of the unit.

C. Exhaust Air Relief Dampers:

1. Economizer shall be equipped with barometric dampers that will open to exhaust return air as more outdoor air is supplied to the conditioned space during economizer operation. This relief shall prevent the conditioned space from over-pressurizing during economizer operation.

2. Exhaust air opening shall be covered with a birdscreen and a rain hood that matches the exterior of the unit.

D. Filters shall be 2" thick replaceable type MERV 8 and internal metal frame work. Provide one spare filter for each unit for Owner's stock.

E. Indoor Fam:

1. Direct drive plenum fan.

2. Backward-curved fan wheel with an external rotor direct drive variable speed indoor motor.

3. Motor shall be thermally protected.

F. Unit Construction:

1. All sheet metal parts shall be constructed of a zinc coated, commercial grade galvanized steel. All external surfaces shall be finished with a UL approved coating system.

2. Removable side panel shall provide easy access for maintenance, service and adjustment.

3. Unit shall be single wall construction with foil faced insulation such that insulation is not exposed to the air stream.

4. Unit shall have lifting lugs on each of the four upper corners.

5. Condenser coils and fan discharge shall be protected by heavy duty wire guards.

G. Basic Safety/Operating Controls - Unit manufacturer shall supply the following safety/operating control features:

1. A thermostat to deenergize the compressors when the suction line temperature drops below 22 deg. F.

2. A five-minute timer to prevent the compressor from short cycling.

3. A lock out circuit to prevent the compressors from cycling on one of their safety controls.

4. A cutout to protect the compressors during abnormally low voltage conditions.

H. Unit shall be completely factory wired, piped, charged and tested by the manufacturer before shipment. BAS Controller: DDC controller shall be provided as part of the work of ATC, field-mounted and wired.

I. Gas Heating Section:

1. Manufacturer shall furnish a natural gas furnace constructed of 20-gauge aluminized steel tubes.

2. Furnace shall include the following controls and safety devices:

   a. Intermittent spark ignition with two stage gas valve with pressure regulator.

   b. Centrifugal blower to maintain positive flue pressure with air pressure safety switch.

   c. Electronic ignition with flame sensor and lockout safety valve.

   d. High temperature limit thermostat with automatic reset.

J. Manufacturer: Trane, York/Johnson Controls, Carrier.

K. Manufacturer shall furnish start-up.

1. Any listed equivalent manufacturer and the Mechanical Contractor shall be completely responsible to comply with all requirements on the contract documents. This shall include, but not be limited to, space requirements, code clearances, the type, horsepower, capacities, number and size of services required from other trades.

PART 3 – EXECUTION

3.1 INSPECTION

A. Examine areas and conditions under which equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to installer.

B. Install in accordance with manufacturer's recommendations. Unit and all component sections shall be properly supported and vibration isolated.

3.2 INSTALLATION

A. Verify that coils, filters, motors, drives and other components are matched with the proper unit.

B. Assemble unit components following manufacturer's instructions for handling, testing and operation. Repair damaged galvanized areas, and paint in accordance with manufacturer's written recommendations.

C. Vacuum clean interior of units prior to operation.

D. Repair air leaks from or into casing that can be heard or felt during normal operation.

E. Install rooftop units in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

F. Perform field mechanical balancing in accordance with Section 230950: TESTING AND BALANCING OF MECHANICAL SYSTEMS.

G. The Mechanical Contractor shall own as part of his work, the following:

Provide one (1) additional drive set, if necessary, to obtain final design balancing requirements. The Mechanical Contractor shall coordinate with Balancing Firm and equipment manufacturer for drive selection, including belts and pulleys.

H. Provide certified factory start-up and written report on all units.

END OF SECTION

SECTION 23 09 00

AUTOMATIC TEMPERATURE CONTROL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Section 230200 and drawings are hereby made a part of this section as fully as if repeated herein.

B. The Mechanical Contractor shall coordinate with the work of Division 26 and the Fire Alarm System vendor for locations and mounting of all duct smoke detectors. These devices are shown on the Mechanical Drawings for reference only to show the intent of the work. All locations shall be determined based on approved shop drawings from the Fire Alarm System vendor and the Contractor for the work of Division 26, Electrical.

1.2 DESCRIPTION OF WORK

A. Provide labor, material and supervision necessary to install a complete direct digital control system of temperature controls to control all HVAC Systems, associated components and accessories as described herein. Coordinate with existing BAS (Alberio Energy).

1.3 QUALITY ASSURANCE

A. Ensure that all work and equipment is installed in accordance with manufacturer's warranty requirements.

B. Provide adequate supervision of labor force to assure that all aspects of specifications are being fulfilled.

C. The system shall be engineered, programmed, and installed by personnel trained and regularly employed by the control’s manufacturer.

D. Supplier shall have technical support to promptly respond within 24 hours or less to service calls to the site with technical staff, spare parts inventory and test and diagnostic equipment.

E. Codes and Approvals:

1. The complete system installation shall be in strict accordance with national and local electrical codes. All devices designed for or used in line voltage applications shall be UL listed.

    a. All microprocessor based devices shall be UL916 listed.

    b. All electrical environmental control and monitoring devices shall be UL429 and/or UL873 listed.

2. All electronic equipment shall conform to the requirements of FCC regulation Class B, Part 15, Section 15 governing radio frequency electromagnetic interference and be so labeled.

3. The complete system shall conform to ANSI/ASHRAE Standard 135-2020, BACNET.

F. All system components shall be designed and built to be fault tolerant.

1. Provide satisfactory operation without damage at 100% above and 85% below rated voltage and at +3 Hertz variation in line frequency.

2. Provide static, transient, and short circuit protection on all inputs and outputs. Communication lines shall be protected against incorrect wiring, static transients and induced magnetic interference. Bus connected devices shall be A.C. coupled or equivalent so that any single device failure will not disrupt or halt bus communication.

1.4 ELECTRICAL WIRING

A. All electrical wiring, components and accessories in connection with the Automatic Temperature Control System shall be furnished and installed by the control's contractor.

1. Electrical Contractor shall provide all wiring to duct smoke detectors.

2. Unless stated otherwise in the design documents, the ATC Contractor is responsible for providing control power to all actuators, devices and components within the DDC System regardless of the selected voltage of those devices. This also includes all 120 volt power circuits required for devices, panels and control equipment.

B. Control wiring shall include all wiring necessary to interface with new controls, such as relays and transducers, and shall also include electric and electronic devices such as freezestats, electronic sensors, relays, flow switches and controlled devices such as damper operators, both electric/electronic actuated devices. Pilot devices such as ON/OFF switches and thermostats installed in series with line voltage circuits shall be considered to be control wiring.

1.5 AUTOMATIC TEMPERATURE CONTROL

A. Provide a system of automatic temperature control which shall be as manufactured by Alerton Technologies, Inc., as installed by Albireo Energy. The system shall be complete in all respects including labor, materials, equipment and services necessary.

B. All electrical wiring in connection with the installation of the automatic temperature control system shall be furnished and installed under the direct supervision of the control manufacturer.

PART 2 – PRODUCTS

2.1 TEMPERATURE SENSORS

A. Solid state room sensors shall be of the wire wound resistance type element. Sensors shall be equipped with visual readout and adjustment. Sensors shall be of the completely solid state type with no moving contacts. Printed circuit board under thermostat cover shall contain a low mass resistance type setpoint dial and amplifier. Provide test points for measuring output voltage. Sensors shall be direct or reverse acting as required for the sequence of operation.

B. Sensors shall provide the application for night setback override.

C. Sensors shall be mounted at ADA height (48" above floor).

2.2 SMOKE DETECTORS

A. Duct type ionization smoke detectors shall be furnished by the Electrical Contractor and installed by

the Mechanical Contractor in the supply and return air stream. The Electrical Contractor shall provide wiring from each detector to the Fire Alarm System panel.

B. The Electrical Contractor shall provide an alarm output signal from the FAS panel to the BAS for unit shutdown.

2.3 ACTUATORS

A. Electronic actuators shall be sized to operate their appropriate dampers with sufficient reserve power to provide smooth modulating action or two-position action as specified.

B. Provide integral, auxiliary switches for direct coupled actuators to indicate when a desired position is reached or to interface additional controls for a specific sequence.

C. Align actuator with drive shaft, provide permanent mark to identify closed position of end device.

2.4 SENSOR TRANSMITTERS

A. Duct and immersion sensors shall have minimum spans as required to meet the temperature requirements. Duct sensors shall have sensing elements of sufficient length and accuracy to measure average duct temperature in each location.

B. Sensors shall be of corrosion resistant construction, tamperproof, suitable for mounting on a vibrating surface. Exposed capillaries shall be temperature compensated, and armored or installed in protective tubing.

C. All sensing elements for water pipe mounting shall be of the rod and tube type with linear output and shall be furnished complete with separable protecting wells filled with heat conductive compound. Sensors shall be factory calibrated and tamperproof. If easily adjustable sensors are provided, they shall be located inside metal enclosures with cylinder lock and key to prevent unauthorized setting.

D. Safety Devices: Provide the following:

1. Low limit, electric type, with 20’ long serpentine element, with manual reset, set for 37°F for “freeze” protection and 55°F for fan discharge application, unless otherwise noted.

2. Air flow switches: Differential pressure type for fan status.

2.5 CONTROL DAMPERS

A. The ATC Sub-contractor shall furnish all the controlled dampers of the type and sizes indicated on the drawings for installation by the sheet metal Sub-contractor.

B. All 2-position control dampers shall be parallel blade and sized for minimum pressure drop, at the specified duct size.

C. All modulating dampers shall be opposed blade and sized for an effective linear air flow control characteristics within the angle of rotation and maximum pressure drops specified. Information shall be provided to the sheet metal Subcontractor for determining the proper duct reductions or baffles used.

D. Damper frames shall not be less than 16-gauge galvanized steel, formed with corner braces for extra

strength, with mounting holes for enclosed duct mounting.

E. All damper blades shall be of not less than 16-gauge galvanized steel formed for strength and high velocity performance. Blades on all dampers must not be over 8" in width. Blades shall be secured to 1/2" diameter zinc plated axles by zinc plated bolts and nuts. All blade bearings shall be nylon or oilite. Blade side edges shall be sealed off against spring stainless steel seals. Teflon coated thrust bearings shall be provided at each end of every blade to minimize torque requirements and insure smooth operation. All blade leakage hardware shall be constructed of corrosion resistant, zinc plated steel and brass.

F. Dampers shall be suitable for operation between -40 and 200 degrees. The control manufacturer shall submit leakage and flow characteristics plus a size schedule for all controlled dampers.

G. All blade edges shall have inflatable seal edging that shall be rated for leakage less than 10 cubic feet per minute per square foot of damper area at a differential pressure of 4" of water when the damper is being held by a torque not to exceed 50 inert lbs. Leakage shall not exceed 1/2 of 1% of total flow.

H. Provide permanent mark or scribe end of drive shaft to align damper with actuator in closed position.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install system and materials in accordance with manufacturer's instructions and roughing-in drawings, and details and drawings. Install electrical work and use electrical products complying with requirements of these specifications. Mount controllers at convenient locations and heights.

B. All wiring shall be properly supported and run in a neat and workmanlike manner. All wiring exposed and in equipment rooms shall run parallel to or at right angles to the building structure. All wiring within enclosures shall be neatly bundled and anchored to prevent obstruction to devices and terminals. All wiring shall be in accordance with all local and national codes. Low voltage wiring for space temperature sensors, communication bus between terminal units, etc., above accessible ceilings in finished spaces on the floors may be plenum rated cable. Wiring in all other locations shall be installed in EMT conduit. All electronic wiring shall be #18 AWG minimum THHN and shielded if required, except standard network (Ethernet, LonWorks, etc.) cabling shall be as tested and recommended in lieu of #18 gauge twisted, #22 or #24 gauge is acceptable if used as a part of an engineered structured cabling system. The control manufacturer must submit technical and application documentation demonstrating that this cabling system has been tested and approved for use by the manufacturer of both the control system and the engineered structured cabling system.

C. Provide all sensing, control, and interlock wiring for the following:

System inputs and outputs

System communications

System power

System interlocks

Unit controls

3.2 ACCEPTANCE

A. The Control Manufacturer shall completely check out, calibrate and test all connected hardware and software to ensure that the system performs in accordance with the approved specifications and sequences of operations approved.

B. Witnessed acceptance demonstration shall display and demonstrate each type of data entry to show site specific customizing capability; demonstrate parameter changes; execute digital and analog commands; and demonstrate DDC loop stability via trend of inputs and outputs.

3.3 SERVICE GUARANTEE

A. The control system herein specified shall be free from defects in workmanship and material under normal use and service. After completion of the installation, the control manufacturer shall regulate and adjust all thermostats, control valves, motors and other equipment provided under this contract. If within twelve (12) months from date of acceptance either for beneficial use of final acceptance, whichever is earlier, any of the equipment herein described is proven to be defective in workmanship or materials, it will be replaced or repaired free of charge. The control manufacturer shall, after acceptance, provide any service incidental to the proper performance of the control system under guarantee outlined above for the period of one year. Normal maintenance of the system or adjustments of components is not to be considered part of the guarantee. The control manufacturer will upon completion of the installation, during the warranty period, make available to the Owner, an annual service agreement covering all labor and material required to efficiently maintain the control system.

3.4 FINAL ADJUSTMENT

A. After completion of installation, adjust thermostats, motors and similar equipment provided as work of this section.

B. Final adjustment shall be performed by specially trained personnel in direct employ of installer of primary temperature control system.

END OF SECTION

SECTION 23 09 50

TESTING & BALANCING OF MECHANICAL SYSTEMS

PART 1 – GENERAL

1.1 JOB CONDITIONS

A. Systems shall be completely installed and in continuous operation as required to accomplish the tests.

B. Heating, ventilating and air conditioning equipment shall be completely installed and in continuous operation as required to accomplish the balance work specified.

C. Adjust and balance shall be performed when outside conditions approximate design conditions indicated for heating and cooling functions.

D. Make at least two inspections of the mechanical systems during construction to verify that balancing procedures may be accomplished. Report findings to the Architect/Engineer/Construction Manager.

E. Balancing firm shall balance Mechanical System two (2) times. The first time shall be considered a rough balance. Any discrepancy in air flow shall be addressed to the Architect/Engineer/Construction Manager. The final balancing will be accomplished after review of rough balance reports.

F. The final balancing reports shall be submitted and approved prior to project's being considered complete; i.e., commencement of warranties.

1.2 ENGINEER QUALIFICATIONS

A. The firm shall be an independent organization having no affiliation with construction contractors, equipment sales or design engineering.

B. The firm shall specialize in balancing heating, ventilating and air conditioning systems.

C. The firm shall show proof of having balanced and tested at least five projects of similar size and scope.

D. All field work shall be under the direct supervision of a registered Professional Engineer who is a full-time employee of the balancing firm.

E. The firm shall be certified by and a member of the AABC (Associated Air Balance Council), or NEBB (National Environmental Balancing Bureau).

1.3 REPORT

A. Data Sheets:

1. Submit data sheets on each item of testing equipment required.

2. Include name of device, manufacturer’s name, model number, latest date of calibration and correction factors.

B. Report Forms:

1. Submit specimen copies of report forms.

2. Forms shall be 8-1/2 x 11 inch paper for loose-leaf binding, with blanks for listing of the required test ratings and for certification of report.

3. Reports shall be on standard forms published by AABC or NEBB.

PART 2 – PRODUCTS

2.1 AIR BALANCE INSTRUMENTS

A. Alnor Velometer with probes and alnor pitot tube.

B. Rotating Vane Anemometer: 4 inch size.

C. ASHRAE Standard Pitot Tubes, stainless steel 5/16 inch outside diameter, lengths 18 inches and 36 inches.

D. Magnehelic Differential Air Pressure Gauges, 0 to 0.5 inches, 0 to 1.0 inch and 0 to 5.0 inches water pressure ranges, each arranged as a portable unit for use with a standard Pitot tube.

E. Combination Inclined-Vertical Portable Manometer, range 0 to 5.0 inches water.

2.2 SYSTEM PERFORMANCE MEASURING INSTRUMENTS

A. Insertion Thermometers, with graduation at 0.5 degrees F for air and 0.1 degrees F for water.

B. Sling Psychrometer.

PART 3 – EXECUTION

3.1 GENERAL REQUIREMENTS

A. Arrange and pay for all tests.

B. Notify Architect/Engineer/Construction Manager at least three working days in advance of test and conduct in presence of Architect/Engineer/Construction Manager.

C. Tests to be performed prior to insulation, covering or concealment.

D. Provide signed report of completion of test with signature of witnesses. Report shall indicate:

1. System Tested

2. Date

3. Specified test requirements and actual testing results

E. The balancing firm shall report to and review the work required with the Architect/Engineer before beginning field balance work. The balancing firm shall make at least two inspections of the air systems during construction and shall report his findings in writing to the Architect/Engineer.

F. The balancing firm shall cooperate with the Architect/Engineer/Construction Manager and the Mechanical Contractor to effect smooth coordination of the balancing work with the job schedule.

G. The balancing firm shall be responsible for getting the various systems into proper operation. They shall enlist the aid of the equipment suppliers and Mechanical Contractor as may be required to effect proper operation consistent with the contract plans and specifications.

H. When the balancing firm cannot balance a belt-driven piece of equipment with the supplied belts and sheaves, inform the Mechanical Contractor that the Mechanical Contractor shall provide additional sheaves as spelled out in other Division 23 Sections.

3.2 DUCTWORK TESTING

A. Witness testing conducted by the Mechanical Contractor per Section 230600, PART 3: EXECUTION.

3.3 BALANCING PROCEDURE

A. Air System Balance:

1. With the fan supply system set to handle normal minimum outdoor air, the balancing firm shall perform the following tests and compile the following information:

Air Handling Equipment

a. Design Conditions:

(1) CFM Supply Air

(2) Static Pressure

(3) CFM Fresh Air

(4) Fan RPM

b. Installed Equipment:

(1) Manufacturer

(2) Size/Model Number

(3) Motor HP, Voltage, Phase, Full Load Amperes

c. Field Test:

(1) Fan Speed

(2) No Load Operating Amperes

(3) Fan Motor Operating Amperes

(4) Calculated BHP

d. Test for Total Air:

(1) Size of discharge, return air and outside air ducts.

(2) Number and locations of Velocity Readings taken.

(3) Duct Average Velocity

(4) Total CFM

(5) Outside Air CFM

(6) Return Air CFM

e. Individual Outlets (Diffusers, Registers and/or Grilles):

(1) Identify each outlet or inlet as to location and area and fan system

(2) Outlet, manufacture and type

(3) Outlet size

(4) Outlet free area, core area, or neck area

(5) Required FPM and test velocity found for each outlet.

(6) Required CFM and test results for each outlet

2. Testing and adjusting of individual outlets shall be performed under procedures recommended by the manufacturers of the outlets. All outlets shall be set for air pattern required and all main supply air and return air dampers to be adjusted and set for design CFM indicated. Any required changes in air patterns, settings, etc., necessary for achieving correct air balance, shall be provided by this Contractor. Total CFM of all outlets shall agree with total CFM of all branches and the grand total shall agree with the air volume for the fan(s).

B. In addition to the above work, the Balancing Firm shall check the operation of all automatic temperature control equipment; verify all thermostat, aquastat, etc., set-points and operations; and enlist the aid of the Mechanical Contractor and the Control Subcontractor to make necessary adjustments where required.

END OF SECTION 23 09 50

SECTION 26 00 00

GENERAL PROVISIONS – ELECTRICAL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the work of this Section.

B. The specification or drawing and the design features or resulting construction disclosed, are the property of Furlow Associates, Inc., and shall not be reproduced without written permission.

C. Refer to Section 078413 for Through-Penetration Firestop Systems.

D. Refer to Section 083113 for Access Doors and Frames

1.2 DESCRIPTION OF WORK

A. Provide all materials, equipment, labor, services and all appurtenances required to completely install and satisfactorily operate the various systems. The items listed below are for general guidance only and do not necessarily include the entire requirements for the project.

1. Coordination with other trades
2. Electrical service
3. Interior feeders
4. Lighting and power panels
5. Lighting branch wiring
6. Power wiring
7. Lighting fixtures and lamps
8. Wiring devices
9. Connections for electrically operated equipment
10. Fire alarm and detection system
11. Telephone/Data systems
12. Lightning protection system
13. Related work as herein described or otherwise defined under the heading "Related Work".

B. Wherever the term "provide" is used, it shall be understood to mean both "furnish" and "install".

1.3 RELATED WORK

A. Equipment specified in sections of Divisions 1 thru 23 that require electric power supply.

B. Work related to this trade as defined on the following contract drawings:

Architectural/Structural

HVAC

Plumbing

1.4 SITE CONDITIONS

A. Attention of all bidders is called to the necessity for a careful inspection of the site, its present condition and encumbrances, the extent of the work, the protection to be afforded to adjacent properties or structure, availability of utilities, the extent and nature of the material required to be excavated and the amount of fill and removal. He shall also determine local or site limitations which will affect construction.

1.5 PERMITS, INSPECTIONS AND ORDINANCES

A. All work shall be executed and inspected in accordance with local and state ordinances, rules and regulations and the requirements of public utilities having jurisdiction. The contractor shall secure and pay for all permits, inspections and connections required.

B. The Electrical Contractor shall furnish a certificate of inspection to the Owner at the time of completion.

C. Requirements of the following organization shall be considered minimum:

1. National Electrical Code

2. National Electrical Safety Code

3. OSHA

4. Local City and County Codes

D. Reference to technical societies, trade organizations and governmental agencies are in accordance with the following:

1. ANSI - American National Standards Institute

2. ASTM - American Society for Testing Materials

3. IEEE - Institute of Electrical and Electronics Engineers, Inc.

4. NEC - National Electrical Code

5. NEMA - National Electrical Manufacturer's Association

6. NFPA - National Fire Protection Association

7. MSS - Manufacturer's Standardization Society

8. IES - Illuminating Engineers Society

9. ETL - Engineering Testing Laboratories

10. EIA - Electronic Industries Association

11. OSHA - Occupational Safety and Health Administration

12. Federal Specifications

13. UL - Underwriters Laboratories, Inc.

1.6 QUALITY ASSURANCE

A. Provide adequate supervision of labor force to assure that all aspects of the contract documents are fulfilled.

B. Contractor to provide manufacturer’s written certification that the following equipment has been installed and will operate correctly and in accordance with the manufacturer’s warranty requirements.

Fire Alarm and Detection System

C. Testing:

1. After completion of the work, the entire wiring system shall test entirely free from grounds, short circuits, opens, overloads and improper voltage.

2. The grounding system shall be tested for a resistance of 25 ohms or less.

3. Perform testing as follows: Arrange and pay for all tests, provide all equipment, materials and labor to perform test. Notify Engineer and Owner three (3) working days before tests are to be made. Conduct tests in the presence of the Engineer or authorized representative. Repeat tests after defects are corrected.

D. Special Engineering Services: In the instance of complex specialized electrical power and signaling systems, and other similar systems, the installation and final connections of these systems shall be made by and/or under the supervision of a competent installation and service engineer who shall be a representative of the respective equipment manufacturer. Any and all expenses of these installation and service engineers shall be borne by this Contractor.

1.7 COORDINATION

A. As a requirement of this project, the Electrical Contractor shall furnish coordination for his equipment and layouts with other subcontractors furnishing equipment and services for Divisions 1 thru 23. Any and all contractors who install their equipment or furnish services prior to coordination,

any contractor who changes their equipment or services after coordination has occurred, without notifying associated subcontractors, shall be held responsible for making all required changes with no additional cost to the Owner. Or delay in construction time. This coordination will include conduit layout to allow access to equipment for maintenance.

B. The Mechanical, Plumbing and Electrical Contractors are responsible to coordinate all manufacturer's recommended circuit breakers, starters, disconnects and fuse sizes for all equipment. Submission of a shop drawing will certify that this has been completed.

C. The drawings and specifications reflect the type, number and size of services required for the equipment the design is based upon. Should the supplying subcontractor elect to furnish an alternate piece of equipment requiring difference services and/or space conditions, he shall inform the subcontractor furnishing those services and be held responsible to pay for all required changes as part of this contract.

1.8 SUBMITTALS

A. Shop Drawings:

1. Shop drawings shall be submitted in accordance with Division 1 of these specifications except where herein modified.

NOTE: Submittals will only be reviewed once and resubmittals will be reviewed once. Any other submittals will be billed to the Contractor at the Engineer's standard rates.

2. Shop drawings comprising complete catalog cuts, performance test data for electrical equipment as required by other sections of Division 26 shall be submitted for review checking. The Contractor shall review these shop drawings for conformance to contract documents prior to submission and affix contractor's signature to each submittal certifying that this review has been done. By approving and submitting shop drawings, product data, wiring diagrams and similar materials, the Electrical Contractor represents that he and/or his subcontractor has determined and verified materials, field measurements and field construction data that relates to the work, and has checked and coordinated this information with all of the Divisions 1 thru 23 subcontractors.

3. All shop drawing submittals shall have the following identification data, as applicable, contained therein or permanently adhered thereto:

a. Project name

b. Project number

c. Sub-Contractor's, Vendor's and/or manufacturer's name and address.

d. Product identification.

e. Identification of deviation from the contract documents.

f. Applicable contract drawings and specification section number.

g. Shop drawing title, drawing number, revision number, and date of drawing and revision.

h. Resubmit revised or additional shop drawings as requested.

i. Wherever shop drawings or vendor's standard data sheets indicate work to be done "by others", it shall be the responsibility of the Contractor making the submission to identify by name, the Contractor who is to do this work. If the Contractor named is other than the Contractor making the submission, the shop drawing submission must be reviewed by the named Contractor and bear his mark of approval, prior to submission to the Architect/Engineer.

j. Where equipment proposed differs from that shown on the drawings or specified, he shall submit for approval drawings showing the manner in which the layout is affected by the substitution.

k. The Contractor shall keep one copy of approved shop drawings at the job site, filed in a suitable metal container. The shop drawings shall be cataloged and kept in good repair, and shall be available for use by the Owner, Architect and Engineer.

l. No equipment shall be ordered, fabricated, etc., before approval of shop drawings.

1.9 SUBSTITUTIONS

A. Whenever a material, article, piece of equipment or system is identified in the following specification or indicated on the drawings by reference to manufacturers' or vendors' names, trade names, catalog numbers or the like, it is so identified for the purpose of establishing the basis of the Bid.

B. Substitution approval must be obtained and included as an addendum item prior to the submission of the bid. An approved substitution shall not be considered as an approval for the contractor or an equipment vendor to deviate from the written portion of the specifications unless so stated in the addendum.

C. The drawings illustrate the space allocated for equipment and the Contractor shall install the equipment accordingly. If changes are required in the building or arrangement due to substitution of equipment, the Contractor making the substitution must pay for the necessary modifications.

D. The listed equivalent or substituted manufacturers along with the bidding related contractor shall be completely responsible to comply with all requirements on all contract documents. This shall include, but shall not be limited to space requirements, code clearances, the type, horsepower, capacities, number and size of services required from other trades, including all required ancillary items furnished and installed by other trades. If the manufacturer or related bidding contractor does not comply with these requirements, then they shall be responsible for any and all additional costs associated with the changes required by other trades.

1.10 LUBRICATION

A. Furnish, install and maintain all required lubrication of any equipment operated prior to acceptance by the Owner. Lubrication shall be as recommended by the equipment manufacturer.

B. Provide one year's supply of lubricants to Owner at date of acceptance.

C. Verify that required lubrication has taken place prior to any equipment start-up.

1.11 ADJUSTMENT & CLEANING

A. Adjust and clean equipment to be placed in proper operation condition.

1.12 EQUIPMENT START-UP

A. Verify proper installation by manufacturer or his representative.

B. Advise General Contractor 2 days prior to actual start-up.

C. Verify proper operation. Obtain signed statement by manufacturer or his representative that equipment is operating within warranty requirements. Submit statement to General Contractor.

1.13 OPERATION AND MAINTENANCE INSTRUCTIONS

A. Properly and fully instruct Owner's personnel in the operation and maintenance of all systems and equipment.

B. Insure that the Owner's personnel are familiar with all operations to carry on required activities.

C. Such instruction shall be for each item of equipment and each system as a whole.

D. Provide report that instruction has taken place. Include in the report the equipment and/or systems instructed, date, contractor, Owner's personnel, vendor, and that a complete operating and maintenance manual has been reviewed.

E. Manual shall include all instructions on operation, maintenance, repair parts list, lubrication requirements, brochures, catalogue cuts, wiring diagrams, piping diagrams, control sequences, service requirements, names and addresses of vendors, suppliers and emergency contacts. Three manuals shall be provided.

F. Submit manuals for review prior to operating instruction period. Manuals shall be 8-1/2 x 11" with hard cover, suitably bound.

G. Training

1. Electrical Contractor shall be responsible for coordination of Owner training. Factory employed technician(s) shall provide training, including demonstration and education on the system capabilities, operation and maintenance. Training sessions shall be minimum 4 hours (maximum 8 hours), and shall be provided for each shift of workers. Scheduled training shall be coordinated at least two (2) weeks in advance with the Owner and the Commissioning Agent.

2. Video Documentation: Furnish three (3) copies of a professionally taped video and three (3) copies of professionally prepared drawings demonstrating the following:

- Emergency Generator System

- Security System

- Fire Alarm System

- Integrated Access Control
- Clock and Speaker System
- VFD’s
- MDF/IDF

1.14 TOOLS

A. All equipment furnished by the Contractor which requires special tools or devices other than those normally available to the maintenance or operating staff shall be furnished in duplicate to the Owner, sufficiently marked, packed or boxed for staff usage. The tools provided shall be listed by the Contractor identified as to their use or the equipment applicable in a written transmittal to the Owner.

1.15 CLEANING AND FINISHING

A. After equipment start-up and all operating tests have been made and the system pronounced satisfactory, each respective Contractor shall go over the entire project, clean all equipment, etc., installed by him and leave in a clean and working condition. Any surfaces found marred after this final cleaning shall be refinished or replaced by each Contractor at no cost to the Owner.

1.16 OPERATING AND MAINTENANCE MANUALS

A. Three complete sets of instructions containing the manufacturer's operating and maintenance instructions for each piece of equipment shall be furnished to the Architect. Each set shall be furnished before the contract is completed. The following identification shall be inscribed on the covers: the words "OPERATING AND MAINTENANCE INSTRUCTIONS", the name and location of the building, the name of the Contractor and the name of the Architect and Engineer. Flysheet shall be placed before instructions covering each subject. The instruction sheets shall be approximately 8-1/2 by 11 inches, with large sheets of drawings folded in. The instructions shall include, but shall not be limited to, the following:

Approved wiring and control diagrams, with data to explain the detailed operation and control of each component.

A control sequence describing start-up, operation and shutdown.

Operating and maintenance instructions for each piece of equipment, including lubrication instructions.

Manufacturer's bulletins, cuts and descriptive data.

Parts lists and recommended spare parts.

1.17 SERVICE INTERRUPTION

A. All service interruptions to the electric or related systems, whether during regular working hours or at any other time, must be coordinated with the Owner. All such interruptions shall be so scheduled and planned as to require a minimum of time and shall occur only during a mutually satisfactory period.

1.18 INTERPRETATION OF SYSTEMS

A. The interpretation of the Architect will be final in the event there is a lack of understanding of the full scope or requirements of the systems under this contract.

1.19 LAYOUTS

A. On small scale drawings, i.e., 1/8" - 1'-0", the approximate location of the electrical branch circuit items such as receptacle, telephone, grounding and equipment outlets are shown to indicate their existence. The exact location of these items and their related raceways are governed by structural conditions, coordination with the work of other trades and the Architect's final decision. By accepting a contract, the Contractor agrees to install the work in accordance with the above statement and within the contract price.

PART 2 – PRODUCTS

2.1 MATERIAL

A. All material shall be new and of good quality. Material shall conform to all accepted trade standards, codes, ordinances, regulations, or requirements governing same, and shall be approved before being installed.

B. The Architect reserves the right to require the Contractors to submit samples of any or all articles or materials to be used on the project.

C. Where any device or equipment is herein referred to in the singular number, such as "the panel", this reference shall be deemed to apply to as many such devices or equipment as are required to complete the installation as shown on the drawings or specified.

D. All materials and equipment used in the work shall comply with the standards of recognized authorities such as UL, NEMA, IEEE, ETL, IES and EIA in every instance where such standards have been established for the particular type of materials to be installed.

E. All similar pieces of equipment or materials of the same type or classification used for the same purpose shall be of the same manufacturer.

F. All manufactured equipment shall have factory applied finishes.

2.2 CONCRETE

A. Concrete shall be in accordance with Section 03300.

B. The 28-day minimum compressive strength shall be 3000 psi.

2.3 WARRANTY

A. Wherever in the specification sections of this division, reference is made to a specific warranty period, this warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the contract documents.

PART 3 – EXECUTION

3.1 INSPECTION

A. Prior to performing the work, examine areas and conditions; check and verify all dimensions, under which the work is to be installed and notify the Architect in writing of conditions and dimensions detrimental to the proper and timely completion of the work. Do not proceed until authorization is given by the Architect.

3.2 LAYING OUT WORK

A. The Contractor is responsible for the accuracy of all lines, elevations, and measurements, grading and utilities and must exercise proper precaution to verify figures shown on drawings before laying out work and will be held responsible for any error resulting from his failure to exercise such precaution.

3.3 WORKMANSHIP

A. Install all work neat, trim, parallel and plumb with building lines in accordance with standard trade practice acceptable to the Architect.

3.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect all equipment and materials from damage during transportation, storage and installation.

3.5 PROTECTION

A. Protect all work, equipment and materials during construction up to the time of acceptance by the Owner.

Arrange and design the protection to prevent damage from infiltration or dust, debris, moisture, chemicals and water. Cap or plug electrical raceways.

B. Protect all surfaces against damage from welding, cutting, burning, or similar construction functions. This protection shall be accomplished by care in operations, covering and shielding. Special care is directed to exposed finished masonry, metal or wood surfaces and painted surfaces. Corrective measures required shall be accomplished by the trade which made the original installation when and as directed by the Architect at the expense of the Contractor.

C. Cover and protect all lighting fixtures as may be necessary until completion of the work. Replace damaged fixtures or damaged fixture parts as directed by the Architect at no cost to the Owner.

D. Do not install devices, polished metal fittings or parts until adjoining tile or masonry work is completed.

E. Maintain and replace protective covering when so directed by the Architect until the work is ready for acceptance.

3.6 CUTTING & PATCHING

A. Furnish information to the General Contractor as to sizes and locations of recesses required to install panel boxes and other equipment or devices. If the information is late or incorrect, this Contractor

shall, at his own expense, have the trade which originally installed the work do the required cutting and patching.

B. Perform all cutting of concrete or other material for passage of raceways as required to install the work.

C. Close all such openings around raceways with material as specified under the heading "SEALING".

D. Install concealed work in place for the mason to wall-in as he carries up the walls; otherwise, this Contractor will be responsible as stated in the first paragraph.

3.7 SEALING

A. Where raceways pass through fire-rated walls and floors, seal opening with RTV foam.

B. Seal raceways entering the building to conform to the requirements of the NEC.

3.8 OFFSETS AND MODIFICATIONS

A. Furnish and install all offsets necessary to install the work and to provide clearance for the work of other trades.

B. Maintain adequate clearance as directed by the Architect/Engineer.

C. Incidental modifications necessary to the installation shall be made as necessary and at the direction and/or approval of the Architect.

3.9 SLEEVES

A. Furnish and install sleeves for all raceways passing through floors and walls. Sleeves shall be Schedule 40 galvanized steel pipe and shall extend 1" above finished floor surface. Where sleeves are set in interior walls, they shall finish flush with the wall.

B. Furnish and install watertight sleeves for all raceways extending through foundation walls into crawl spaces, mechanical rooms or basement areas from building exterior or from unexcavated areas to building interior. Sleeve shall consist of extra heavy pipe sleeve with anchor flange. Space between raceway and the sleeve shall be sealed with modular wall and casing seal similar to Thunderline Corporation "Link-Seal", Metraseal or approved substitute. Install seal in strict accordance with the manufacturer's recommendations.

3.10 EXCAVATION

A. The excavation shall be of the open-trench method and to the depths and widths as may be necessary. The Contractor shall do all excavation required in connection with his work. Bottoms of trenches shall be excavated to a uniform grade. All materials excavated shall be deposited on the side of the trenches and beyond the reach of slides. Excavated material shall not be piled where it will interfere with traffic.

B. No conduits shall be bedded directly on rock. They shall be cushioned by a 6-inch layer of crushed stone or gravel of selected grade, of size to pass through a 3/4" mesh sieve. Not less than 30% shall be fine which will pass through a 3/8" mesh sieve.

C. Where excavation is required through tree root areas, roots shall be saw cut, treated with pruning paint and covered with burlap. Burlap shall be wet and shall be protected and maintained in a moist condition during entire period of exposure. Backfill shall be carefully placed and hand-tamped to a minimum of 6" above roots.

D. Bidder shall base his estimate upon the presumption that all excavation required in the performance of this Contract will be earth. If rock is encountered, Contractor will be reimbursed for the additional work required to remove same based upon the unit cost established in the proposal.

E. All detached boulders or loose stone not exceeding 1 cubic yard, all topsoil, sand, gravel, clay, rubbish, walls or other subgrade construction, and all other materials of every name and nature which can be removed without breaking up with pneumatic breakers shall be considered earth excavation.

F. All rocks, attached boulders, boulders exceeding 1 cubic yard, walls or other subgrade construction and materials which cannot be removed without breaking up with pneumatic equipment shall be considered rock excavation.

G. Before commencing any rock excavation for which extra compensation is to be paid, a rock contour drawing shall be prepared by the Contractor and checked by the Architect. The width shall be based on 2'-0". This rock contour drawing and width allowance will be used to compute the quantity of rock for which the Contractor will be reimbursed at the unit price established.

3.11 SHORING AND PUMPING

A. The Contractor shall provide all shoring, bracing or sheet piling necessary to maintain the banks of his excavation and shall take out same as the work progresses and filling in has been accomplished. Shoring shall be in accordance with OSHA Standards.

B. The arrangement of shoring must be such as to prevent any movement of the trench banks and consequent strains on the conduits. Shoring shall be provided to prevent damage to work installed by other trades.

C. The Contractor shall do all pumping required to keep his excavations free of water. The water shall be conveyed in piping or watertight troughs a sufficient distance that it will flow from the site and not affect other work being performed.

3.12 BACKFILLING

A. After work in trenches has been completed, they shall be filled with good, clean, fine earth in 8" layers and shall be pneumatically tamped before the next layer of material has been filled in. The backfill shall be free of excavated rock, cinders, stones, brickbats or other debris.

B. Wherever rock is removed, the Contractor shall secure and fill select clean earth to a minimum depth of 3'-0" above the top of the conduit. Unless otherwise indicated, no rock shall be deposited in the trench fill. This clean earth fill shall be procured other than from the site unless permission for earth borrow from the site is granted by the Architect. If site borrow is permitted, the topsoil removal, relocation and finished grading will be accomplished as directed by the Architect.

C. Under no circumstances shall excavated material be left where it will interfere with the Owner's or other Contractor's operations.

D. All earth and other materials taken from the trenches and not required for backfilling shall be deposited where directed, or removed from the premises as directed by the Architect.

E. Any rock removed from the excavation shall be removed from the project site by the Contractor.

F. Trenches which pass under wall footings or within 18" of column footings shall be backfilled with clean concrete. To secure adequate foundation support, the method and depositing of the concrete fill shall be as directed by the Architect. To prevent the concrete from adhering to the conduits, necessary conduit protection shall be applied.

3.13 FOUNDATIONS FOR EQUIPMENT/HOUSEKEEPING PADS

A. Provide all foundations for equipment installed under this specification Division and/or as indicated on plans.

B. Construct concrete foundations on structural floor slabs or on grade in the manner or as required by the approved shop drawing details of the manufacturer or the utility company.

C. Provide and install concrete.

D. Metal reinforcement shall be deformed steel bars or cold drawn steel wire, or fabricated forms of these materials as required.

E. Furnish anchors of size and number noted, with bottom plates and sleeves.

F. Forms shall conform to the shape, lines, grades, and dimensions of the concrete, required by the approved shop drawing details of the equipment manufacturers, or approved on the Contractor's Equipment room layouts. They shall be sufficiently tight to prevent leakage of mortar and shall be braced or tied together to maintain position and shape. Forms shall be moved in such manner as to insure the complete safety of the structure.

G. All exposed corners or edges shall be chamfered. All burrs, fins, irregularities of forming or spillage shall be removed and the surface float or trowel finished to a smooth, straight surface.

H. Housekeeping Pads: Provide 4” thick, and size as required by approved shop drawings, concrete pad for all equipment installed on floor. Pad shall be steel reinforced with all edges and surfaces finished as described above. When installing over existing concrete, surface of existing pad shall be prepped using a bushing tool to rough in entire surface. Whether pouring over new or existing concrete, provide U-shaped rebar anchors set in epoxy to secure pad to pad.

3.14 ITEMS RECESSED IN MASONRY CONSTRUCTION

A. Wherever boxes, electric panels, equipment, devices, access panels, and similar items of electrical construction are installed in exposed masonry construction, the Contractor shall utilize and submit for approval items of such size, height, and arrangement to conform to the corresponding masonry unit. The Contractor shall include as part of this contract, the necessary offsets, adjustments and relocations necessary to conform with the instructions of the Architect as to the final location of the equipment item in the exposed masonry.

B. As part of his contract and before the purchase of the items hereinbefore mentioned, the Contractor shall notify the Architect of such modifications in the building arrangement that will be necessary to accommodate the proposed equipment.

3.15 ROOF FLASHINGS

A. All conduit extending through roofs shall be provided with watertight flashing and counterflashing as hereinafter described.

B. Furnish and install standard counterflashing fittings on the conduit or properly designed clamped counterflashing with caulking as directed by the Architect/Engineer.

3.16 PAINTING

A. Refinish all factory applied finishes that have been damaged to match the original finish as directed by the Architect.

B. Prime coat all steel furnished under this Division with material and methods as described in another Section under the heading "PAINTING".

3.17 EQUIPMENT CONNECTIONS

A. Provide required wiring, raceways and final connections for all equipment provided by this Division and Divisions 1 thru 23.

B. Make final connections in accordance with wiring diagrams obtained from equipment manufacturer.

C. Rough-in in accordance with approved shop drawings from the manufacturer or supplier of the equipment. Rough-in prior to shop drawing approval will be subject to change without adjustment to contract cost.

3.18 BALANCING

A. The system of feeder and branch circuits for power and lighting shall be connected to panel busses in such a manner as to electrically balance the connected load as close as is practicable. Should the Owner disclose any unfavorable conditions reacting on the service, this Contractor shall make such changes as may be suggested to balance the load.

3.19 GUARANTEE

A. All work shall be guaranteed to be free from defects for a period of two years of operation from date of acceptance by the Owner unless otherwise specified in Division 1.

B. Guarantee shall be extended on an equal time basis for all non- operational periods due to failure within the guarantee period.

C. Contractor to include an 11 month “walk-thru” of the building system with representatives of the School District, Architect, Engineer and the Construction Manager. The purpose is to establish a list of corrective work that relates to operational issues, material/installation deficiencies.

END OF SECTION 26 00 00

SECTION 26 00 55

ELECTRICAL IDENTIFICATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. This section is a Division 26 Basic Materials and Methods Section, and is part of each Division 26 Section making reference to electrical identification specified herein.

1.2 DESCRIPTION OF WORK

A. Types of electrical identification specified in this section include the following:

Cable conductor identification.

Operational instructions and warnings.

Danger signs.

Equipment/system identification signs.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products of one of the following (for each type of marker):

W. H. Brady Co.

Ideal Industries, Inc.

Seton Name Plate Co.

3M Electrical Products

2.2 ELECTRICAL IDENTIFICATION MATERIALS

A. Provide manufacturer's standard products of categories and types required for each application. Where more than single type is specified for an application, selection is Installer's option, but provide single selection for each application.

2.3 COLOR-CODED PLASTIC TAPE

A. Provide manufacturer's standard vinyl tape not less than 7 mils thick by 3/4" wide.

B. Colors: Unless otherwise indicated or required by governing regulations, provide tape color as indicated in Paragraph 3.2.B.

C. Tape shall be of Type 3M Scotch 35 for color coding, Scotch Super 33+ for splices and Tem Flex 1700 for general use.

2.4 CABLE/CONDUCTOR IDENTIFICATION BANDS

A. Provide manufacturer's standard vinyl cloth, self-adhesive cable/conductor markers of wrap-around type; either pre-numbered, plastic-coated type, or write-on type with clear plastic, self-adhesive cover flap; numbered to show circuit identification.

2.5 BAKED ENAMEL DANGER SIGNS

A. Provide manufacturer's standard "DANGER" signs of baked enamel finish on 20-gage steel; of standard red, black and white graphics; 14" x 10" size except where 10"x 7"is the largest size which can be applied where needed, and except where larger size is needed for adequate vision; with recognized standard explanation wording (as examples: HIGH VOLTAGE, KEEP AWAY, BURIED CABLE, DO NOT TOUCH SWITCH).

2.6 ENGRAVED PLASTIC-LAMINATE SIGNS

A. Provide engraved stock melamine plastic laminate, in sizes and thicknesses indicated, engraved with engraver's standard letter style of sizes and wording indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.

B. Thickness: 1/16" for units up to 20 sq. in. or 8" length; 1/8" for larger units.

C. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate substrate.

2.7 LETTERING AND GRAPHICS

A. Coordinate names, abbreviations and other designations used in electrical identification work, with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of electrical systems and equipment.

PART 3 – EXECUTION

3.1 APPLICATION AND INSTALLATION

A. Coordination: Where identification is to be applied to surfaces which require finish, install identification after completion of painting.

B. Regulations: Comply with governing regulations and requests of governing authorities for identification of electrical work.

3.2 CABLE/CONDUCTOR IDENTIFICATION

A. Apply cable/conductor identification on each cable and conductor in each box/enclosure/cabinet where wires of more than one circuit or communication/signal system are present. Match identification with marking system used in panelboards, shop drawings, contract documents, and similar previously established identification for project electrical work.

B. Conductor Color Coding:

1. All conductors used in all systems shall have insulation that is inherently colored. All conductors of a system performing the same function shall be colored alike throughout the project.

2. Equipment Grounding Conductors:

a. Standard and/or general feeders or circuits shall be green.

b. Isolated feeders or circuits shall be green with yellow stripe.

3. On larger conductors, where colored insulation is not available, colored tape adhesive vinyl bands 3/4" width may be installed 6" maximum from the end of the conductors. Where passing through pull boxes without splice, each conductor shall be banded.

4. Power system conductor colors shall be as follows:

a. 120/208 Volt System

Phase A - Black

Phase B - Red

Phase C - Blue

Neutral - White or Gray

b. 277/480 Volt System

Phase A - Brown

Phase B - Orange

Phase C - Yellow

Neutral - White or Gray

3.3 DANGER SIGNS

A. In addition to installation of danger signs required by governing regulations and authorities, install appropriate danger signs at locations indicated and at locations subsequently identified by Installer of electrical work as constituting similar dangers for persons in or about project.

B. High Voltage: Install danger signs wherever it is possible, under any circumstances, for persons to come into contact with electrical power voltages higher than 110-120 volts.

3.4 EQUIPMENT/SYSTEM IDENTIFICATION

A. Install engraved, plastic laminate sign on each major unit of electrical equipment in building, including central or master unit of each electrical system including communication/signal systems, unless unit is specified with its own self-explanatory identification or signal system. Except as

otherwise indicated, provide single line of text, 1/2" high lettering on 1-1/2" high sign (2" high where 2 lines are required), white lettering in black field. Provide text matching terminology and numbering of the contract documents and shop drawing. Provide signs for each unit of the following categories of electrical work:

1. Panelboards, electrical cabinets and enclosures.
2. Access panel/doors to electrical facilities.
3. Major electrical switchgear, main and feeder circuit breakers and/or disconnects..
4. Power transfer equipment.
5. Fire Alarm Master Station and Annunciator.
6. Paging and Intercommunication Systems
7. Security Control Panels and Annunciator.

B. Install signs at locations for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrate with fasteners, except use adhesive where fasteners should not or cannot penetrate the substrate.

3.5 JUNCTION AND PULL BOX IDENTIFICATION

A. Emergency Systems: Each junction and pull box cover shall be painted orange. Use black indelible liquid marker to label "EMERG." in 3/8" letters minimum.

B. Fire Alarm System: Each junction and pull box cover shall be painted red. Use black indelible liquid marker to label "F.A." in 3/8" letters minimum.

C. Feeders Shown on Single Line Diagram: Each junction and pull box shall be marked with black indelible liquid marker with the assigned feeder number "FDR #38" in 3/8" letters minimum.

END OF SECTION 26 00 55

SECTION 26 01 10

RACEWAYS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

B. Refer to Section 260000 for General Provisions - Electrical.

1.2 DESCRIPTION OF WORK

A. Types of raceways in this section include the following:

Rigid metal conduit

Intermediate metal conduit

Electrical metallic tubing.

Polyvinyl chloride conduit (Exterior Underground Only)

Flexible metal conduit.

Liquid-tight flexible metal conduit.

Multi-Cell Raceway

Wireways.

1.3 REFERENCE STANDARDS

A. Refer to Section 260000 for a general description of requirements applying to this Section.

1.4 QUALITY ASSURANCE

A. Refer to Section 260000 for a general description of requirements applying to this Section.

1.5 WARRANTY/GUARANTEE

A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, GENERAL REQUIREMENTS.

1.6 COORDINATION

A. The drawings and details there upon are scheme and/or diagrammatic in nature, and indicate the need and intent of the design. These are to be used for general guidance only. It shall be the responsibility

of the Electrical Contractor to coordinate, with other Division Subcontractors, the installation of all raceways, raceway supports, junction boxes and required fittings. This coordination will include conduit layout to allow access to equipment for maintenance.

B. This coordination shall be carried out prior to actual installation; this shall be done to eliminate the possibility of conflicts between trades on items such as access, clearances and maintenance issues that may arise after completion of construction.

C. Should the coordination not be carried out prior to installation, and a conflict exists, the installing contractor shall remove and reinstall the equipment as required to clear the conflict at no additional cost to the Owner and no delay in project completion.

PART 2 – PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Rigid Metal Conduit:

1. Raceway: Full weight, heavy wall rigid steel with zinc coating conforming to ANSI-C80.1.

2. Fittings: Cast malleable iron fittings with threaded hubs, insulated throat and zinc protective coating.

3. Subject to compliance with requirements, provide products of one of the following:

Allied Tube and Conduit Corporation

LTV Steel Tubular Products Co.

Wheatland Tube

B. Intermediate Metal Conduit:

1. Raceway: Light weight, rigid steel, hot dipped galvanized manufactured in accordance with UL1242.

2. Fittings: Cast malleable iron fittings with threaded hubs, insulated throat and zinc protective coating.

3. Subject to compliance with requirements, provide products of one of the following:

Allied Tube and Conduit Corporation

LTV Steel Tubular Products Co.

Wheatland Tube

C. Electrical Metallic Tubing:

1. Raceway: Light weight, thin wall, rigid steel, hot dipped galvanized manufactured in accordance with ANSI C80.3.

2. Fittings: Raintight, insulated throat, compression type with zinc protective coating.

3. Subject to compliance with requirements, provide products of one of the following:

   Allied Tube and Conduit Corp.

   LTV Steel Tubular Products Co.

   Wheatland Tube Co.

D. Polyvinyl Chloride Conduit:

1. Raceway: Heavy wall, rigid non-metallic, schedule 40 with bell type end, designed for above ground exposed applications, direct earth burial, and concrete encasement.

2. Fittings: Polyvinyl chloride, heavy duty, glue type, designed for Schedule 40 application.

3. Subject to compliance with requirements, provide products of one of the following:

   Allied Tube & Conduit

   Carlon

   Queen City Plastics, Inc.

   Scepter Electric Systems

   Cantex, Inc.

E. Flexible Metal Conduit:

1. Raceway: Construct of single strip, flexible, continuous, interlocked, and double-wrapped steel, galvanized inside and outside.

2. Fittings: Steel, insulated throat, with zinc protective coating.

3. Subject to compliance with requirements, provide products of one of the following:

   AFC

   Alflex Corp.

   Electri-Flex Company

F. Liquid-Tight Flexible Metal Conduit:

1. Raceway: Construct of single strip, flexible, continuous, interlocked, and double-wrapped, galvanized inside and outside, coat with liquid-tight jacket of flexible polyvinyl chloride.

2. Fittings: Steel, water and oiltight, insulated throat, with zinc protective coating.

3. Subject to compliance with requirements, provide products of one of the following:

   AFC

   Alflex Corp.

   Electri-Flex Company

G. Multi-Cell Raceway

1. Raceways: Shall be a multi-cell raceway system for concrete encasement applications, 20 ft. lay length sections of 4" PVC outer shell type C with four (4) 1-1/4" nominal pre-lubed PVC innerducts pre-installed. The innerducts shall be color coded (white/grey/orange/green). Raceway shall be similar to Carlon Telecom System Part No. MXSS4S-020.

2. Fittings: Raceway shall be provided with a complete line of, but shall not necessarily be limited to, couplings, offsets, 90 deg., 36" radius bends, adapters, hold-down clips, end-caps and other accessories as needed for a complete system.

H. Wireways:

1. Furnish electrical wireways of the type, size, and style for each service indicated. Wireway shall be a complete assembly including but not necessarily limited to, couplings, offsets, elbows, adapters, hold-down clips, end-caps and other components and accessories as needed for a complete system.

2. System shall fulfill wiring requirements as indicated in contract documents, and shall comply with applicable portions of Article 362 of the National Electrical Code.

3. Subject to compliance with requirements, provide products of one of the following:

   Circle AW Products Co.

   The EMF Company, Inc.

   Hoffman Engineering Company

   Square "D" Company

J. The above items shall include the statement "Approved Equal" and/or "Approved Substitute". This statement requires that the product or item be in compliance with the written intent of this specification and the submission meets the requirements of Section 260000.

PART 3 – EXECUTION

3.1 INSTALLATION OF ELECTRICAL RACEWAYS

A. Install electrical raceways in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA "Standard of Installation", and complying with recognized industry practices.

B. Coordinate with other work as necessary to interface installation of electrical raceways, wireways and required components.

C. Raceways used for distribution, feeders, or branch circuits shall be a minimum size of 3/4" or equal equivalent cross-sectional area. Raceways used for control and signal shall be a minimum size of 1/2" or equal equivalent cross-sectional area.

D. All raceways shall be concealed within the building construction.

E. All raceways installed in ceiling cavities and exposed within mechanical spaces shall be run parallel with building lines and installed level and square at the proper elevation/height.

F. Complete the installation of electrical raceways before starting the installation of cables/wires within the raceway.

G. Furnish and install one (1) nylon or fiberglass pull cord in each empty raceway. Each empty raceway shall be cleaned, capped, and tagged as to its termination location.

H. Install liquid-tight flexible metal conduit for connections to motors and for other electrical equipment when subject to movement and vibration, and also where subjected to one or more of the following conditions:

1. Exterior locations.

2. Moist or humid atmosphere when condensation can be expected to accumulate.

3. Corrosive atmosphere.

4. Subjected to water spray.

5. Subjected to dripping oil, grease or water.

I. Install Electrical Metallic Tubing for building interior electrical work except:

1. Underground

2. In gravel, cinder, concrete or other sub-base floor construction.

3. Horizontal runs in concrete floor slabs.

4. Where exposed to the elements.

5. In masonry construction below finished grade.

6. Vertically in poured concrete walls.

J. Refer to Section 260000 for excavation, shoring and pumping, concrete and backfilling requirements.

K. Where and whenever possible, install horizontal electrical raceways as tight to building construction as possible and above water, drain and steam piping. A separation of at least six (6) inches shall be maintained between electrical conduits and hot water and steam piping.

L. In accordance with NEC requirements, install Rigid or Intermediate Metal Conduit where Electrical Metallic Tubing is not permitted.

M. In all instances where recessed type panelboards are installed, furnish and install one (1) one-inch raceway for each two (2) future circuits for which "space" or "spare" provisions have been made in the panelboard. These raceways shall extend between the panelboard cabinet and a convenient location above an access panel or a removable tile ceiling construction and capped.

3.2 CLEANING

A. Upon completion of installation of raceways, inspect interiors of raceways; remove burrs, dirt and construction debris.

END OF SECTION 26 01 10

SECTION 26 01 20

WIRES AND CABLES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. This section is a Division 26 Basic Materials and Methods section and is part of each Division 26 Section making reference to wires and cables specified herein.

1.2 DESCRIPTION OF WORK

A. Electrical wire and electrical cable work is indicated by drawings and specifications.

B. Types of wire, cable and connectors in this section include, but not limited to the following:

Copper conductors.

Tap type connectors.

Split-bolt connectors.

C. Refer to other sections of Division 26 for, but not limited to, raceways, connections used in conjunction with wire and cable work.

D. Applications for wire, cable and connectors required for project are as follows unless otherwise indicated:

1. Primary Service Circuitry.
2. Power Distribution Circuitry.
3. Appliance and Equipment Circuitry.
4. Motor Branch Circuitry.
5. Control Circuitry.
6. Signal/Communication Circuitry.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Wire and Cable

Anaconda Wire and Cable Co.

Advance Wire and Cable, Inc.

American

Cerro Wire and Cable Co.

Electrical Conductors, Inc.

General Cable Corp.

Hitemp Wires, Inc.

Rome Cable Corp.

Southwire Company

Triangle PWC,, Inc.

The Okonite Co.

General Electric Co.

Rockbestos Surprenant Cable Corp.

Prysonian (Pirelli)

Connectors

Burndy Corp.

Eagle Electric Mfg. Co., Inc.

Gould, Inc.

Ideal Industries, Inc

Joslyn Mfg. and Supply Co.

O-Z/Gedney Co.

Pyle National Co.

Thomas and Betts Co.

2.2 WIRE, CABLE AND CONNECTIONS

A. Except as otherwise indicated, provide wire, cable and connectors of manufacturer's standard materials, as indicated by published product information; designed and constructed as recommended by manufacturer, and as required for the installation. Minimum wire and cable size is #12 AWG for power and branch circuits and #14 AWG for control and signal/communication circuits unless otherwise indicated.

B. Wire: Provide factory fabricated wire of sizes, ratings, materials and types indicated for each service. Where not indicated, provide proper selection as determined by Installer to comply with project's

installation requirements and NEC standards. Select from the following types, materials, conductor configurations, insulation and coverings:

UL Type: THHN

UL Type: TW

UL Type: THW

UL Type: THWN

UL Type: TF

UL Type: XHHW

UL Type: MC (Metal Clad)

Material: Copper

Conductors: Solid (AWG 14 to AWG 10 only).

Conductors: Concentric-lay-stranded (standard flexibility)

Outer Covering: Nylon

Outer Covering: Thermoplastic

C. Connectors: Provide factory fabricated metal connectors of sizes, ratings, materials, types and classes as required for each service. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements and NEC standards. Select from the following types, classes, kinds and styles.

Type: Pressure

Type: Crimp

Type: Threaded

Class: Insulated

Class: Non-insulated

Kind: Copper (for CU to Cu connection).

Style: Butt connection

Style: Elbow connection

Style: Combined "T" and straight connection

Style: "T" connection.

Style: Split-bolt parallel connection

Style: Tap connection

Style: Pigtail connection

D. 25KV Cable: Provide factory fabricated and tested primary service cable; underground residential distribution (URD) type cable, size #1/0 AWG solid aluminum and #4/0 AWG copper conductor with 25KV cross-linked polyethylene insulation (XLP) with tinned or coated copper wire full size concentric neutral as approved by the Utility Company.

E. 25KV Terminations: Provide 25KV terminations for 25KV #1/0 AWG solid and #4/0 AWG copper aluminum cable.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install electrical cables, wires and connectors, in compliance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in accordance with recognized industry practices.

B. Coordinate cable and wire installation work with electrical raceway and equipment installation work, as necessary for proper interface. Pull conductors together where more than one is being installed in a raceway. Use pulling compound or lubricate, where necessary; compound must not deteriorate conductor or insulation. Use pulling means including fish tape, cable or rope which cannot damage raceway. Rope must be used as pulling means when pulling wires or cables into plastic conduit and duct. Keep conductor splices to a minimum and install in junction boxes only. No splices shall be permitted within conduit. Install splices and tapes which have mechanical strength and insulation rating equivalent or better than conductor. Use splice and tape connectors which are compatible with conductor material.

C. Installation of 25KV primary service cable.

D. 25KV cable terminations.

3.2 FIELD QUALITY CONTROL

A. Prior to energization, test cable and wire for continuity of circuitry and also for short circuits. Correct malfunctions when detected.

B. Subsequent to wire and cable hook-ups, energize circuitry and demonstrate functioning in accordance with requirements.

C. Test 25KV cable after installation using D.C. high potential (Hi-Pot) testing. All testing shall be performed in accordance with cable manufacturer's recommended specifications. Keep a complete record of all tests and submit to the Engineer upon completion. Testing shall be performed by an independent cable testing company or service.

END OF SECTION 26 01 20

SECTION 26 01 21

WIRE CONNECTIONS AND DEVICES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. This section is a Division 26 Basic Materials and Methods Section and is part of each Division 26 Section making reference to connectors and termination devices specified herein.

1.2 DESCRIPTION OF WORK

A. Extent of electrical connectors and termination work is indicated by drawings and specifications.

B. Types of connectors and termination devices in this section include, but are not limited to the following:

1. High voltage termination kits

2. Tap type connectors.

3. Split-bolt connectors.

C. Refer to other sections of Division 26 for, but not limited to, raceways, wires and cables used in conjunction with connectors and termination devices.

D. Applications for connectors and termination devices required for project are as follows unless otherwise indicated:

1. Primary distribution circuitry

2. Branch circuitry

3. Equipment circuitry

4. Control circuitry

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's data on electrical connectors, high voltage termination to the Engineer.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide connectors, high voltage terminations of one of the following manufacturers for each item used:

Burndy Corp.

Eagle Electric Mfg. Co., Inc.

Gould, Inc.

Ideal Industries, Inc.

Joslyn Mfg. and Supply Co.

O-Z/Gedney Co.

Pyle National Co.

Thomas and Betts Co.

Cooper Power Systems

2.2 CONNECTORS

A. Provide factory fabricated metal connectors of sizes, ratings, materials, types and classes as indicated for each service. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements and NEC standards.

Type: Pressure

Crimp

Threaded

Class: Insulated

Non-Insulated

Kind: Copper (for CU to Cu connection).

Style: Butt Connection

Elbow connection

Combined "T" and straight connection

"T" connection

Split-bolt parallel connection

Tap connection

Pigtail connection

2.3 HIGH VOLTAGE LOADBREAK ELBOW CONNECTORS

A. Furnish a one-piece, three phase, non-skirted, loadbreak elbow type rubber termination classified as ANSI/IEEE Standard 386 "200 AMP Loadbreak Interface No. 1, 8.3/14.4 KV, with the following characteristics:

1. Standard voltage class 15KV
2. Maximum rating phase to phase 14.4KV
3. Maximum rating phase to ground 8.3KV
4. AC 60 Hz. 1 minute withstand 34KV
5. DC 15-minute withstand 53KV
6. Bil and full wave crest 95KV
7. Minimum corona voltage level 11KV

B. Terminator shall be designed for three phase operation, fully shielded and submersible when mated with the proper components.

C. The high voltage terminator shall be detailed for terminating a solid dielectric shielded power cable rated 15KV, with a copper tap shield construction.

D. Terminator shall be a 200AMP, 15KV Class, loadbreak elbow connector with tape shield adapter, similar to Cooper Power Systems (RTE).

PART 3 – EXECUTION

3.1 600 VOLT CABLE CONNECTOR INSTALLATION

A. Install electrical connectors, in compliance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in accordance with recognized industry practices.

B. Coordinate cable, wire and connector installation work with electrical raceway and equipment installation work, as necessary for proper interface. Pull conductors together where more than one is being installed in a raceway. Use pulling compound or lubricate, where necessary, compound must not deteriorate conductor of insulation, and must be in accordance with wire and cable manufacturer's recommendations. Use pulling means including fish tape, cable or rope which shall not damage raceways including plastic conduits and ducts.

3.2 HIGH VOLTAGE TERMINATION INSTALLATION

A. Install high voltage terminations in compliance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in accordance with recognized industry practices.

B. Coordinate terminations with cable, raceway and equipment installation work, as necessary for proper interface. Contractor shall coordinate termination kits with the size, type and style of high

voltage cable being installed, in accordance with cable and termination manufacturer's written instructions and recommendations.

3.3 FIELD QUALITY CONTROL

A. Prior to energization, test cable and wire for continuity of circuitry and also for short circuits. Correct malfunctions when detected.

B. Subsequent to wire and cable hook-ups, energize circuitry and demonstrate functioning in accordance with requirements.

C. Test high voltage cable after installation using direct current high potential (Hi-Pot) testing. All testing shall be performed in accordance with cable manufacturer's recommended specifications. The Electrical Contractor shall keep a complete record of all tests and submit to the Engineer upon completion. All high voltage cable testing shall be performed by an independent cable testing company or service.

END OF SECTION 26 01 21

SECTION 26 01 35

ELECTRICAL BOXES & FITTINGS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. This section is a Division 26 Basic Materials and Methods section, and is a part of each Division 26 section making reference to electrical wiring boxes and fittings specified herein.

1.2 DESCRIPTION OF WORK

A. Types of electrical boxes and fittings in this section include the following:

Outlet boxes.

Junction boxes.

Pull boxes.

Conduit bodies.

Bushings.

Locknuts.

Knockout closures.

PART 2 – PRODUCTS

2.1 INTERIOR METALLIC OUTLET BOXES

A. Provide galvanized flat rolled sheet steel interior outlet non-gangable wiring boxes, of types, shapes and sizes, including box depths, to suit each respective location and installation; construct with stamped knockouts in back and sides and with threaded screw holes with corrosion-resistant screws for securing box covers and wiring devices.

B. Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes, which are compatible with outlet boxes being used and fulfilling requirements of individual wiring situations. Choice of accessories is Installer's option.

C. Manufacturer: Subject to compliance with requirements, provide interior outlet boxes of one of the following:

Appleton Electric Co.

Bell Electric/Square D Co.

Pass and Seymour, Inc.

RACO, Inc.

Steel City/Midland-Ross Corp.

2.2 WEATHERPROOF OUTLET BOXES

A. Provide corrosion resistant cast-metal weatherproof outlet wiring boxes, of types, shapes and sizes, including depth of boxes, with threaded conduit ends, cast-metal face plates with spring-hinged waterproof caps suitably configured for each application, including face plate gaskets and corrosion-resistant fasteners.

B. Manufacturer: Subject to compliance with requirements, provide weatherproof outlet boxes of one of the following:

Arrow-Hart Div., Crouse-Hinds Co.

Bell Electric/Square D Co.

Harvey Hubbell, Inc.

O-Z/Gedney Co.

Slater Electric Co.

2.3 JUNCTION PULL BOXES

A. Provide galvanized code-gauge sheet steel junction and pull boxes, with screw-on covers; of types, shapes and sizes, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.

B. Manufacturers: Subject to compliance with requirements, provide junction and pull boxes of one of the following:

Adalet-PLM Div., Scott and Fetzer Co.

Appleton Electric Co.

Arrow-Hart Div., Crouse-Hinds Co.

Bell Electric/Square D Co.

GTE Corporation

Keystone Columbia, Inc.

O-Z/Gedney Co.

Slater Electric Co.

Spring City Elect. Mfg. Co.

2.4 CONDUIT BODIES

A. Provide galvanized cast-metal conduit bodies, of types, shapes, and sizes, to suit respective locations and installation, construct with threaded-conduit-entrance ends, removable covers, and corrosion-resistant screws.

B. Manufacturers: Subject to compliance with requirements, provide conduit bodies of one of the following:

Appleton Electric Co.

Crouse-Hinds Co.

Gould, Inc.

Killark Electric Mfg. Co.

O-Z/Gedney Co.

Spring City Electrical Mfg. Co.

2.5 BUSHINGS, KNOCKOUT CLOSURES AND LOCKNUTS

A. Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts and insulated malleable iron conduit bushings, offset connectors, of types and sizes to suit respective uses and installation.

B. Manufacturers: Subject to compliance with requirements, provide bushings, knockout closures, locknuts and connectors of one of the following:

Appleton Electric Co.

Burndy Corp.

Crouse-Hinds Co.

Gould, Inc.

O-Z/Gedney Co.

RACO, Inc.

Steel City/Midland-Ross Corp.

Thomas and Betts Co., Inc.

PART 3 – EXECUTION

3.1 INSTALLATION OF ELECTRICAL BOXES AND FITTINGS

A. Install electrical boxes and fittings, complying with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in compliance with recognized

industry practices to ensure that products fulfill requirements.

B. Coordinate installation of electrical boxes and fittings with wire/cable and raceway installation work.

C. Provide weatherproof outlets for interior and exterior locations exposed to weather or moisture.

D. Provide knockout closures to cap unused knockout holes where blanks have been removed.

E. Install boxes and conduit bodies in those locations to ensure ready accessibility of electrical wiring.

F. Avoid using round boxes where conduit must enter box through side of box, which would result in difficult and insecure connections when fastened with locknut or bushing on rounded surface.

G. Fasten boxes rigidly to substrates or structural surfaces to which attached, or solidly embed electrical boxes in concrete or masonry.

H. Provide electrical connections for installed boxes.

I. Pull boxes and junction boxes shall be furnished and installed in all conduit runs at intervals not exceeding 100 feet maximum.

J. Identify each circuit in all pull boxes and junction boxes whether the box contains one or more circuits.

END OF SECTION 23 01 35

SECTION 26 01 40

WIRING DEVICES

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. The extent of wiring device work is indicated by drawings, schedules and specifications. Wiring devices are defined as single discrete units of the electrical distribution system which are intended to carry but not utilize electric energy.

B. Types of electrical wiring devices in this section include the following:

Receptacles.

Switches.

Device plates.

Contactors

Energy Control Devices

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's data on electrical wiring devices.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products of one of the following (for each type of wiring device):

Legrand Co.

Hubbell, Inc.

Leviton Mfg. Co.

Lutron Electronics Co., Inc.

Square D Co.

Eaton Corp.

Siemens

Wattstopper

2.2 FABRICATED WIRING DEVICES

A. Provide factory fabricated wiring devices, in types, styles, colors, and electrical ratings for applications indicated and complying with NEMA Standards Pub. No. WD 1. Where types and grades are not indicated, provide proper selection as determined by Installer to fulfill wiring requirements, and complying with NEC and NEMA Standards for wiring devices. Color selection to be verified by Contractor with Architect/Engineer.

2.3 RECEPTACLES

A. All simplex receptacles shall be extra heavy duty, 20 amperes, 125 volts, 2 pole, 3 wire grounding, with green hexagonal equipment ground screw, with metal plaster ears, side wiring, NEMA configuration 5-20R unless otherwise indicated. Hubbell Cat. #HBL5361 or approved substitute.

B. All duplex receptacles shall be extra heavy duty, 20 amperes, 125 volts, 2 pole, 3 wire grounding type with green hexagonal equipment ground screw, with metal plaster ears, side wiring, NEMA configuration 5-20R unless otherwise indicated. Hubbell Cat. #HBL5362 or approved substitute, HBL5362TR where tamperproof is indicated.

C. Special Purpose Receptacles: Provide polarized grounding type special purpose receptacles of the required amperage and voltage ratings, extra heavy duty. Device shall include a green hexagonal equipment ground screw.

D. All ground fault receptacles shall be extra heavy duty duplex, tamper resistant, 20 amperes, 125 volts, 2 pole, 3 wire grounding type with green hexagonal equipment ground screw,integral ground fault circuit interrupter, UL rated Class A, Group 1, with metal plaster ears, side wiring, NEMA Configuration 5-20R, self-testing with red and green LED indicator lights. Device shall include solid state ground-fault sensing and signalling, with a 5 milliampere ground fault trip level, plus or minus 1 milliampere. Hubbell Cat. #GFR5362SG or approved substitute.

1. Whether indicated or not on the floor plans, the Electrical Contractor shall furnish and install GFI protected devices in kitchen areas on countertops near sinks, water coolers, refrigerators, on rooftop equipment, on exterior walls; and as indicated by the N.E.C., it shall be the discretion of the Electrical Contractor to provide GFI receptacles or GFI circuit breaker. Receptacles protected by GFI circuit breakers shall be permanently labeled on the faceplate as GFCI.

2.4 SWITCHES

A. Toggle Switch: Provide extra heavy duty, industrial series flush toggle, 1 pole, 2 pole, 3-way, 4-way AC quiet switch rated 20 amperes @ 120/277 volts with green hexagonal equipment ground screw, metal plaster earls, and side wired screw terminals. Similar to Hubbell Series HBL Series or approved substitute.

2.5 DEVICE PLATES

A. Provide switch and receptacle outlet wall plates for wiring devices, of types, sizes, and with ganging and cut outs required by the devices being installed. Construct with metal screws for securing plates to devices; screw heads colored to match finish of plates; plates colored to match wiring devices to which attached. Provide device plates possessing the following additional construction features: **Receptacle outlet plates to be permanently marked with panel designation and circuit number on front side of plate.**

1. Metal Plates to be stainless steel of non-corrosive and non-magnetic 302 alloy, .032" nominal thickness. Plates shall have brushed satin finish.

2. Non-Metallic Plates to be a thermoplastic, virtually indestructible, molded polycarbonate material offering resistance to impact, scratches, discoloration and be self-extinguishing. Plates shall have no-line smooth finish.

B. Weatherproof device plates shall have spring-hinged waterproof cap suitably configured for each application, including face plate gaskets and corrosion-resistant fasteners.

C. Existing mechanical spaces where concealed work is impractical, such as masonry pr block walls, Provide 4" square boxes, surface mounted, with ½" deep surface mounted device plates consisting of same material for devices indicated on plans, whether single or double gang. Use of plaster flange and standard cover plate will not be acceptable.

2.6 ENERGY CONTROL DEVICES (Occupancy Sensors)

A. Line Voltage:

1. Combination wall switch and sensor shall be Dual Technology Passive Infrared and Ultrasonic, designed for single gang outlet box installation, with a coverage of 180° for a maximum of 400 square feet. Device shall be suitable for 120/277 dual voltage operation, and have vandal resistant, hard sensor lens. Device shall be similar to Sensor Switch Cat. No. WSD-PDT or Wattstopper DW-100 Series, DW-103 Series for multi-way, DW-200 for dual relay, DW-203 for multi-way dual relay, or approved substitute.

2. Ceiling sensor shall be Dual Technology Passive Infrared and Ultrasonic 360° coverage, 1200 square feet maximum. Self Contained Relay Device shall be suitable for 120/277 Dual Voltage operation. Device shall be similar to Sensor Switch Cat. No. CMR-PDT, Wattstopper DT-355 or approved substitute.

B. Low Voltage:

1. Ceiling mounted sensor shall be Dual Technology Passive Infrared and Ultrasonic with 360° coverage up to 2o feet. Device accepts 12 to 24 volt AC or DC. Device shall be similar to Sensor Switch Cat. No. CM-PDT or approved substitute.

2. Sensor power pack shall be a low voltage power supply with an input of either 120 volts or 277 volts AC and an output of 24 volts DC @ 150 mA. Device shall contain a 20 AMP isolated load control relay. When relay is used, power supply output shall be reduced to 24 volts DC @ 114 mA. Device shall be similar to Sensor Switch PP-20 or approved substitute.

PART 3 – EXECUTION

3.1 INSTALLATION OF WIRING AND CONTROL DEVICES

A. Install wiring devices as indicated, in compliance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in accordance with recognized industry practices to fulfill project requirements.

B. Coordinate with other work, including painting, electrical box and wiring work, as necessary to

interface installation of wiring devices with other work.

C. Install wiring devices only in electrical boxes which are clean, free from building materials, dirt and debris.

D. Provide electrical connections for wiring and control devices.

E. Delay installation of all wiring and control devices until wiring work is completed.

F. Isolated Ground Receptacle Devices shall be connected to the system ground by way of an insulated ground conductor color coded green with a yellow stripe.

3.2 PROTECTION OF WALL PLATES AND RECEPTACLES

A. At time of Substantial Completion, replace those items which have been damaged, including those burned and scorched by faulty plugs.

3.3 GROUNDING

A. Provide electrically continuous, tight grounding connections for wiring and control devices.

3.4 TESTING AND COMMISSIONING

A. Prior to energizing circuitry, test wiring devices for electrical continuity and proper polarity connections. After energizing circuitry, test wiring devices to demonstrate compliance with requirements.

B. After energizing circuitry, the Electrical Contractor shall test and adjust all control devices to provide optimum operation and performance.

C. All areas where energy control devices are specified shall be verified for full coverage and accurate operation. If any area is determined by the Owner, Architect, or Engineer to have inadequate coverage or operation, Contractor shall provide additional energy control devices to remedy the coverage or operation issue. For bidding purposed, own 5 extra devices fully installed. After successful commissioning, uninstalled devices shall be handed over to the Owner for spare devices. Device types shall be as required for commissioning, or as selected by Owner for spare devices as applicable.

END OF SECTION 26 01 40

SECTION 26 01 70

MOTOR AND CIRCUIT DISCONNECTS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of motor and circuit disconnect switch work is indicated by drawings and schedules.

B. Types of motor and circuit disconnect switches in this section include the following:

Equipment disconnects.

Appliance disconnects.

Motor-circuit disconnects.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's data including specifications, installation instructions and general recommendations, for each type of motor and circuit disconnect switch required.

1.3 COORDINATION

A. The drawings are scheme and/or diagrammatic in nature, and indicate the need and intent of the design. These are to be used for general guidance only. It shall be the responsibility of the Electrical Contractor to coordinate, with other Division Subcontractors, the installation of all motor and circuit disconnect switches, supporting hardware, including wiring and conduit, to and from the equipment. This coordination will include conduit layout to allow access to equipment for maintenance.

B. This coordination shall be carried out prior to actual installation; this shall be done to eliminate the possibility of conflicts between trades on items such as access, clearances and maintenance issues that may arise after completion of construction.

C. Should the coordination not be carried out prior to installation, and a conflict exists, the installing contractor shall remove and reinstall the equipment as required to clear the conflict at no additional cost to the Owner and no delay in project completion.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products of one of the following (for each type of switch):

Cutler-Hammer, Inc. (Eaton)

Square D Company

Siemens

2.2 FABRICATED SWITCHES

A. Safety Switches: Safety switches shall be of sizes noted on the drawings, fusible or non-fusible and contained in a general purpose enclosure. All switches shall be type HD and have quick-make, quick- break operation. All switches shall be of proper horsepower rating as applicable and have dual interlocks designed to interlock the switch box door with the switch operating mechanism. Unit shall be provided with a suitable means of interlock release. An arrangement shall be provided for locking the operating handle in the "ON" or "OFF" position. Safety switches shall have the proper type metal enclosure, i.e., standard, weatherproof, etc., to suit their specific location as required by the National Electrical Code.

B. Fuses: Provide fuses for safety switches, as recommended by switch manufacturer, of classes, types and ratings needed to fulfill electrical requirements for service indicated.

C. Provide connections for all disconnect switches as indicated on the drawings.

PART 3 – EXECUTION

3.1 INSTALLATION OF MOTOR AND CIRCUIT DISCONNECT SWITCHES

A. Install motor and circuit disconnect switches where indicated, complying with manufacturer's written instructions, applicable requirements of NEC, NEMA, and NECA's "Standard of Installation", and in accordance with recognized industry practices to ensure that products fulfill requirements.

B. Install disconnect switches used with motor-driven appliances, and motors and controllers within sight of controller position unless otherwise indicated.

C. Provide electrical connections for motor and circuit disconnect switches.

END OF SECTION 26 01 70

SECTION 26 01 80

OVERCURRENT PROTECTIVE DEVICES

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of overcurrent protective device work is indicated by drawing schedules and specifications.

B. Types of overcurrent protective devices in this section include the following:

1. Service entrance rated disconnect.

2. Molded case circuit breaker.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's data on overcurrent protective devices, including: voltages and current ratings, interrupting ratings, current limitations, internal inductive and non-inductive loads, time-current trip characteristic curves, and mounting requirements.

B. Shop Drawings: Submit layout drawings of overcurrent protective devices, showing spatial relationships of units to associated electrical equipment, and connections to electrical power supplies.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include the following:

1. Circuit-Breakers

Cutler-Hammer, Inc. (Eaton)

Square D Co.

Siemens

2.2 CIRCUIT BREAKERS

A. Except as otherwise indicated, provide circuit breakers and ancillary components, of types, sizes, ratings and electrical characteristics indicated, which comply with manufacturer's standard design, materials, components, and construction in accordance with published product information, as required for a complete installation.

B. Service Entrance Rated Disconnect: The service disconnect device shall be a molded-case circuit breaker totally front accessible and front connectable. The circuit breaker shall be a three pole device suitable for operation on a 480 volt, 60 Hertz system. Circuit breaker shall have 65,000 RMS symmetrical amperes interrupting rating, and shall be UL approved for Service Entrance equipment.

C. Molded-Case Circuit Breakers: Provide factory assembled, molded-cased circuit breakers of frame size indicated; 120/208 volts, and 277/480 volts 60 Hertz, one, two, or three poles with a short circuit symmetrical ampere interrupting rating as indicated by the panel schedule and/or as shown by the single line riser diagram. Provide circuit breakers with permanent thermal instantaneous magnetic trips in each pole with ampere ratings as indicated. Construct with overcenter, trip-free, toggle type operating mechanisms with quick-make, quick- break action and positive handle trip indication. Construct devices for mounting and operating in any physical position and operating in an ambient temperature of 40 degrees C. Provide circuit breakers with mechanical screw type connector lugs, AL/CU rated.

PART 3 – EXECUTION

3.1 INSTALLATION OF OVERCURRENT PROTECTIVE DEVICES

A. Install overcurrent protective devices as indicated in contract documents, in accordance with the manufacturer's written instructions and with recognized industry practices to ensure that protective devices comply with requirements. Comply with NEC Standards for Installation of overcurrent protective devices.

B. Coordinate with other work, including electrical wiring work, as necessary to interface installation of overcurrent protective devices with other work.

C. Fasten circuit breakers without causing mechanical stresses, twisting or misalignment being exerted by clamps, supports, or cabling.

3.2 ADJUST AND CLEAN

A. Inspect circuit-breaker operating mechanisms for malfunctioning and, where necessary, adjust units for free mechanical movement.

3.3 FIELD QUALITY CONTROL

A. Prior to energization of overcurrent protective devices, test devices for continuity of circuitry and for short-circuits. Correct malfunctioning units, and then demonstrate compliance with requirements.

END OF SECTION 26 01 80

SECTION 26 01 90

SUPPORTING DEVICES

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. Types of supports, anchors, sleeves and seals specified in this section include the following:

Hangers.

Riser Clamps.

C-clamps

I-beam clamps.

One-hole conduit straps.

Two-hole conduit straps.

Round steel rods.

Lead expansion anchors.

Toggle bolts.

U-Channel Strut Systems.

PART 2 – PRODUCTS

2.1 MANUFACTURED SUPPORTING DEVICES

A. Provide supporting devices, complying with manufacturer's standard materials, design and construct in accordance with published product information, and as required for a complete installation, and as herein specified.

B. Supports: Provide supporting devices of types, sizes and materials having the following construction features:

Hangers: For supporting EMT conduit, electro-galvanized steel, with 1/4" minimum diameter hole for round steel rod; approximately MSS types 5, 7, 9 or spring steel conduit clips.

Reducing Couplings: Steel rod reducing coupling, 1/4" minimum black steel.

C-Clamps: Black malleable iron, 1/4" minimum rod size.

I-Beam Clamps: Black steel, 1-1/4" x 3/16" stock; 3/8" cross bolt; flange width 2"; approx. 52 pounds per 100 units.

One-Hole Conduit Straps: For supporting EMT conduit, electro- galvanized steel.

Two-Hole Conduit Straps: For supporting EMT conduit, electro-galvanized steel; 3/4" strap width; and 2-1/8" between center of screw holes.

Hexagon Nuts: For 1/4" rod size; galvanized steel.

Round Steel Rod: Black steel; 1/4" min. dia.

Offset Conduit Clamps: For supporting rigid metal conduit; black steel.

C. Anchors: Provide anchors of types, sizes and materials indicated; and having the following construction features:

Lead Expansion Anchors: 1/4" - 20 Minimum.

Toggle Bolts: Springhead; 3/16 x 4".

D. Manufacturer: Subject to compliance with requirements, provide anchors of the following:

Ackerman Johnson Fastening Systems, Inc.

Elcen Metal Products Co.

Ideal Industries, Inc.

Rawlplug Co., Inc.

Star Expansion Co.

U.S. Expansion Bolt Co.

Erico Products, Inc. (Caddy)

Hilti, Inc.

E. U-Channel Strut Systems: Provide U-channel strut system for supporting electrical equipment, 16-gauge hot dip galvanized steel, construct with 9/16" dia. holes, 8" o.c. on top surface, with standard hot dip galvanized finish, and with the following fittings which mate and match with U-channel.

Beam clamps.

Thinwall conduit clamps.

Conduit hangers.

U-bolts.

F. Manufacturers: Subject to compliance with requirements, provide channel systems of one of the following:

B-Line Systems, Inc.

Elcen Metal Products Co.

Power-Strut Div.; Van Huffel Tube Corp.

Unistrut Div.; GTE Products Corp.

Hilti, Inc.

PART 3 – EXECUTION

3.1 INSTALLATION OF SUPPORTING DEVICES

A. Install hangers and anchors in accordance with manufacturer's written instructions and with recognized industry practices to ensure supporting devices comply with requirements. Comply with requirements of NECA, NEC and ANSI/NEMA for installation of supporting devices.

B. Install hangers, supports, clamps and attachments to support piping properly from building structure. Arrange for grouping of parallel runs of horizontal conduits to be supported together on trapeze type hangers where possible. Install supports with maximum spacings.

END OF SECTION 26 01 90

SECTION 26 04 72

BRANCH CIRCUITS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. Branch circuit work is indicated by drawings.

B. The branch circuits shall include furnishing and installing a complete wire and conduit or cable system between panelboards and lighting fixtures, receptacles, fractional horsepower motors, and small single-phase loads.

C. Types of equipment to be furnished and installed in this section include the following:

Rigid Raceways – See Section 260110

Electrical Metallic Tubing (EMT)

MC (Metal Clad) (Concealed Work only)

Wires and Cables

Junction Boxes

Pull Boxes

Conduit Bodies

Bushings

Locknuts

Supporting Devices

PART 2 – PRODUCTS

2.1 BRANCH CIRCUITS

A. Furnish each branch circuit with an assembly of materials, including but not necessarily limited to, conduit, wire, cable, pull boxes, junction boxes and other items and accessories needed for a complete installation. Where materials or components are not otherwise indicated, comply with NEC, NEMA and established industry standards for applications indicated.

2.2 CONVENIENCE BRANCH CIRCUITS

A. Intent:

1. The intent of this portion of the specifications is to describe the requirements of a convenience circuit as it applies to 120-volt receptacles.

2. All convenience branch circuits may consist of more than one 120-volt receptacle.

B. Convenience Circuit - General: A circuit consisting of a phase and neutral conductor, which may share its neutral with other phase conductors provided that the neutral conductor does not become overloaded due to circuit phase relationship. This type of circuit shall also include an equipment grounding conductor as described under the grounding section of the specifications.

C. Convenience Circuit - Dedicated: A circuit consisting of a phase and neutral conductor which DOES NOT share conductors with any other circuits. This type of circuit shall also include an equipment grounding conductor as described under the grounding section of the specifications.

PART 3 – EXECUTION

3.1 INSTALLATION OF BRANCH CIRCUITS

A. Install branch circuits, complying with equipment manufacturer's written instructions, applicable requirements of NEC, NEMA, and NECA's "Standard of Installation", and in accordance with recognized industry practices.

B. Multiple circuits within a single raceway or cable shall be permitted under this section. It shall be the responsibility of the Electrical Contractor to assure that the neutral conductors do not become overloaded due to circuit phase relationship, and isolated grounds not become voided or compromised due to miswiring or wrong connections.

C. The Electrical Contractor shall use metal clad cable in lieu of electrical metallic tubing (EMT) above tile ceilings as fixture drops only. Metal clad cable shall be supported from building structure of fixture support wires only. Securing cables to the ceiling support system shall not be acceptable. In all areas of exposed construction, electrical metallic tubing (EMT) shall be installed.

END OF SECTION 26 04 72

SECTION 26 05 10

BUILDING LIGHTING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. Lighting fixture work is indicated by specifications, drawings and schedules.

B. Types of lighting fixtures in this section include the following:

1. LED

C. Applications of lighting fixtures required for the project include the following:

1. General Lighting.

2. Supplementary Lighting.

3. Emergency Lighting.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's data on building lighting fixtures.

B. Shop Drawings: Submit dimensioned drawings of lighting fixture installations, including but not necessarily limited to, layout, relation to associated panelboards, and connections to panelboards. Submit fixture shop drawings in booklet form with separate sheet for each fixture, assembled in luminaire "type" alphabetical order, with proposed fixture and accessories clearly indicated on each sheet.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Each lighting fixture type specified represents a specific style and quality of fixture acceptable for this project.

B. The Engineer reserves the right to reject any shop drawing and to request a resubmission should the contractor submit a shop drawing of an equivalent manufacturer which is viewed as being of an incompatible style or inferior quality.

C. No fixture shop drawing shall be submitted, nor will any be accepted, for any manufacturer which is not specifically listed for that fixture type. When a fixture manufacturer is listed for a specific fixture type, this does not provide him with the right to submit for fixtures he is not listed under. A bidding Contractor may elect to bid using non-listed fixtures for the listed Lighting Representatives. The Engineer and the Architect shall make the final decision on whether the submitted fixture meets the project's requirements during shop drawing review.

D. Should the Contractor be unable to obtain approval of the resubmitted manufacturer, then he should submit the basis of design specified manufacturer/fixture.

2.2 LIGHTING FIXTURES

A. Provide lighting fixtures of the size, type and rating indicated complete with, but not necessarily limited to, housings, lamp holders, reflectors, ballast, lamps, mounting frames, pendants and wiring; wired and connected in place, complete, tested and left in satisfactory operating condition.

B. LED Drivers

1. All LED fixtures shall be provided with integral drivers (unless noted otherwise) and must operate at line voltage as indicated on drawings (unless noted otherwise).

2. LED drivers shall have operating temperature of 50°F - 140°F unless noted otherwise.

3. LED drivers shall carry a 5-year warranty.

C. Fixture Lamps: For the type, number and color of the fixture lamps, refer to the Lighting Fixture Schedule on the drawings.

PART 3 – EXECUTION

3.1 INSTALLATION OF LIGHTING FIXTURES

A. Install lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of NEC, NECA's "Standard of Installation", NEMA Standards and with recognized industry practices to ensure that lighting fixtures fulfill requirements of the project.

B. Install lighting fixtures in removable tile ceilings using 3/8" flexible metal conduit with 3 # 12 awg. conductor. Maximum length of flexible lead shall not exceed 60". Flexible lead shall extend from the fixture to the junction box. The junction box shall be securely fastened to the building structure above the removable tile ceiling and shall not serve more than two (2) lighting fixtures, nor shall the junction box support any of the lighting fixtures.

3.2 LIGHTING FIXTURE MOUNTING

A. 1' x 4', 2' x 2' and 2' x 4' fixtures installed in a removable tile ceiling shall be installed using T-Bar grid safety clips as provided by the fixture manufacturer and as required by the NEC.

B. 2'x 2' and 2' x 4' fixtures installed in a removable tile ceiling shall be installed using support wires at all four corners of the fixture. The support wires shall be carried up to the building structure and securely anchored using screwed or bolted hardware. Pressure type clips will not be acceptable. The Electrical Contractor shall be responsible for installing or having installed these four (4) support wires.

C. 1' x 4' fixtures installed in a removable tile ceiling shall be installed using support wires at two (2) corners of the fixture. The support wires shall be carried up to the building structure and

securely anchored using screwed or bolted hardware. Pressure type clips will not be acceptable. The Electrical Contractor shall be responsible for installing or having installed these Two (2) support wires.

D. Downlights installed in a removable tile ceiling shall be installed using 24" spreader bars attached to the T-Bar grid system. Two (2) support wires shall be installed, one (1) on each side of the fixture and centered between the spreader bars, these support wires shall be carried up to building structure and securely anchored using screwed or bolted hardware. Pressure type clips will not be acceptable. The Electrical Contractor shall be responsible for installing or having installed these two (2) support wires.

E. Pendant lighting fixtures, either chain, cable or stem hung below a removable tile ceiling shall be installed in accordance with fixture manufacturer's written instructions and recommendations. The Electrical Contractor shall furnish and install support wire or threaded rod from the fixture mounting hardware up to building structure and securely anchor using screwed or bolted hardware. Pressure type clips will not be acceptable. These support devices shall be independent from the ceiling T-Bar grid system, the system may be used as a guide, but in no way shall the T-Bar grid system carry any of the weight produced by the fixture or it's support devices.

F. Surface mounted fixtures installed on removable tile ceilings or dry wall ceilings shall be installed in accordance with fixture manufacturer's written instructions and recommendations.

1. Fixtures installed on removable tile ceilings shall be anchored to the T-Bar grid system using snap-on clips with threaded studs and wing nuts. The Electrical Contractor shall furnish and install a support wire from each snap-on clip carried up to building construction and securely anchor using screwed or bolted hardware.

2. Fixtures installed on dry wall ceilings shall be mounted using spring-loaded toggle bolts. The number and location of the anchors shall depend on the fixture manufacture's written instructions and recommendations. It shall be the responsibility of the Electrical Contractor to follow these instructions and recommendations.

3.3 ADJUST and CLEAN

A. Clean lens, reflectors and interiors of all lighting fixtures of dirt and construction debris upon completion of installation.

B. Protect installed lighting fixtures from damage during the remainder of the construction period.

3.4 FIELD QUALITY CONTROL

A. Upon completion of the installation of the lighting fixtures, and after the building circuitry has been energized, apply electrical energy to demonstrate capability and compliance with project requirements. Where possible, correct malfunctioning units at the site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting.

B. At the time of Substantial Completion, replace lamps in lighting fixtures which are observed to be noticeably dimmed after Contractor's use and testing, as judged by the Architect/Engineer. Furnish six (6) Type "A" and two (2) Type "A"(E) stock lighting fixtures. Deliver the replacement stock as directed to the Owner's storage area.

1. Refer to Division 1 sections for the replacement/restoration of lamps in lighting fixtures, where used for temporary lighting prior to the time of Substantial Completion.

C. Replace defective and burned out lamps for a period of one (1) year following the time of Substantial Completion.

3.5 GROUNDING

A. Provide tight equipment grounding connections for each lighting fixture installation, in accordance with fixture manufacturer's recommendations and the NEC's requirements.

END OF SECTION 26 05 10

SECTION 26 07 40

NETWORK CABLING SYSTEMS

PART 1 – GENERAL

1.1 GENERAL PROVISIONS

A. Refer to other sections for General Requirements, etc., which shall apply to the work specified in this section. The following specifications for network cabling are based on the Communications Cabling Construction Standards generated and implemented for all State of Delaware schools and was developed by the State of Delaware, Department of Technology and Information (DTI).

B. In general, the network sub-contractor will furnish, install and test all cabling and terminations herein specified for distribution of the station/field wiring.

C. The Electrical Contractor shall utilize one of the approved State of Delaware installing contractors as indicated on the State list. The contractors are approved for furnishing, installation and testing of the entire network. The contractor must be certified and authorized for the installation of premises cabling system and shall assume responsibility for certifying the installation and providing a warranty for a period of no less than 25 years.

1.2 SCOPE

A. Perform all work necessary and/or required and furnish all materials and equipment for a complete network cabling system as described herein.

B. The data communications system shall be installed, consisting of the following components:

1. Optical fiber network backbone

2. Twisted pair copper work station cabling

3. Work station outlets

4. Cable support system

C. The MDF shall be connected to each IDF via a single, twelve- strand, composite, single-mode optical fiber cable. Each classroom and office data outlet shall be connected to its respective IDF via a four twisted-pair, Cat 6 data cables.

D. The hardware shall include equipment racks, patch panels, station outlets, Cat 6 data cables, optical fiber cables, all required terminations required copper/fiber patch cablesand labeling to provide for a complete data distribution system.

E. In general, one or more data outlets shall be provided for each computer station in classrooms, library and in offices where indicated on floor plans. The teacher’s station outlet located in each classroom shall have data/Voip, and audio cable connections.

1.3 SUBMITTALS

A. Furnish shop drawings and descriptive data, complete with project designations for the following:

1. Equipment Racks
2. Patch Panels
3. Station Outlets
4. Cat 6 Data/Voip Cables
5. Optical Fiber Cables – OS2 Single Mode
6. Cable Support System
7. Wire Management Materials
8. Video cables as indicated in schedule on drawing.
9. Shielded Audio Cables

1.4 DOCUMENTATION

A. The contractor shall provide a complete system walk-through, by suitably qualified personnel, to personnel designated by the owner, to instruct them on the installed system's location, operation and maintenance.

B. Prior to assembly and installation, the contractor shall submit the following, on reproducible media, to the engineer for review

1. Final schematic drawings of all circuitry, including outlet conductor assignments and all component callouts.
2. Equipment modifications drawings.
3. Front mechanical drawings of each equipment rack.

C. At the completion of the installation, the contractor shall provide one (1) copy of each of the following:

1. Equipment manufacturer's operation and maintenance manuals for each piece of equipment.
2. "As-built" drawings for all equipment installed.
3. "As-built" drawings on contract blueprints of all wire, cable and conduit placement throughout the building.
4. "From-To" listing of in-building wiring and outlets, listing color coding scheme and conductor assignments.

PART 2 – PRODUCTS

2.1 DELAWARE STATE STANDARDS

A. Authority: Title 29, Chapter 90C provides broad statutory authority to the Department of Technology and Information to implement statewide and interagency technology solutions, policy, standards and guidelines for the State of Delaware's technology infrastructure. "Technology" means computing and telecommunications systems, their supporting infrastructure and interconnectivity used to acquire, transport, process, analyze, store and disseminate information or data electronically. The term "technology" includes systems and equipment associated with e- government and Internet initiatives.

B. Applicability: Applies to all State of Delaware communications and computing resources. DTI is an Executive Branch Agency and has no authority over the customers in Legislative and Judicial Branches, as well as school Districts, and other Federal and Local Government entities that use these resources. However, all users, including these entities, must agree to abide by all policies, standards promulgated by DTI as a condition of funding, access and continued use of these resources.

C. Purpose: Cable configuration and installation is critical to providing connectivity in State buildings. This standard provides guidance for the design and installation of cabling. This standard provides guidance and requirements for data, voice, and CATV structured cabling systems and support infrastructure in all State owned and leased facilities and buildings.

D. Scope

1. Areas Covered: This standard covers the best practices and installation requirements for Voice, Data, CATV cabling and support structures including conduits and raceways, Voice and Data rooms and closets.

2. Environments: This standard applies to all State owned and leased building and office spaces. It is concerned with all Data, Voice, and CATV cabling projects, whether they are for new construction or revisions additions and upgrades to existing systems.

E. Process

1. Adoption: These standards have been adopted by the Department of Technology and Information (DTI) through the Technology and Architecture Standards committee (TASC) and are applicable to all information Technology use throughout the State of Delaware.

2. Revision: Technology is constantly evolving; therefore, the standards will need to be regularly reviewed. It is the intent of the TASC to review each standard annually. The TASC is open to suggestions and comments from knowledgeable individuals within the State, although we ask that they be channeled through your Information Resource Manager (IRM).

3. Contractors: Contractors or other third parties are required to comply with these standards when proposing technology solutions to DTI or other State entities. Failure to do so could result in rejection by the Delaware Technology Investment Council. For further guidance, or to seek review of a component that is not rated below, contact the TASC at dti_tasc@state.de.us.

4. Implementation responsibility: DTI and/or the organization's technical staff will implement these best practices during the course of normal business activities, including business case review, architectural review, project execution and the design, development, or support of systems.

5. Enforcement: DTI will enforce these best practices during the course of normal business activities, including business case and architectural review of proposed projects and during the design, development, or support of systems. These best practices may also be enforced by others during the course of their normal business activities, including audits and design reviews.

6. Contact us: Any questions or comments should be directed to dti_tasc@state.de.us.

F. Executive Summary

1. Because of ever-advancing Industry Standards and new Alliances between Cable and Hardware Manufactures and Vendors, this document seeks to enhance and clarify the State of Delaware's wiring and cabling standards and specifications for Structured Cabling Systems. Approved Contractors under State of Delaware Contract # 05-441-TL are required to adhere to these specifications and standards.

2. The structured cabling system will support Voice, Data, and imaging applications within State-owned and - leased office facilities. This document describes the Structured Cabling System requirements to be met in the proposals for Communications cabling by Vendors and Contractors. These requirements encompass all materials, design, engineering, installation, supervision, and training services for a Structured Cabling System.

3. The following are examples of the Structured Cabling Systems that can be bid for new construction and whole building renovations, in which case all building structured cabling wiring is replaced. The choice of a Structured Cabling System is not limited to the Vendors or Manufactures listed below. The Channel Solutions shall be bid when possible. If a Link solution is bid the State Contact, PM, or DTI (Department of Technology and Information) must authorize the installation.

4. In new construction projects, the default cabling infrastructure shall be Category 6 unless specified otherwise. Where building renovations and additions do not require the removal of the existing structured cabling system, the existing cabling in conjunction with new cabling should maintain the system warranties. If the existing structured cabling system is not Category 5e or better, it must be upgraded to CAT6 or better with a matching patch panel.

    - Hubbell Premise Wiring
    - Ortronics
    - Panduit
    - Systimax

5. Terms and Conditions of Bids/quotes

    a. An approved Contractors bid submittal should be based on the materials, systems,

equipment, and Standards described in this document and in the bid response format of the attached example. Refer to Appendix G. All bids must be submitted in accordance with the specifications and information contained herein, as well as with any addenda, if required.

b. The bid package shall be accompanied by a presale warranty commitment, binding the Installation Contractor and Manufacturer to the customer-selected extended warranty package as described in State Contract # 05-441-TL page 21 section 3) paragraph b).

c. At any point in time, should you require clarification or have any questions pertaining to the content of this document, please call The State of Delaware Department of Technology and Information (DTI). 302-739-9500.

G. Objective

1. This document has been developed as a source of information to assist in the design, implementation and maintenance of Voice, Data and Broad Band communications systems. It contains standards and specifications which guide users through structured cabling system design, planning, and installation.

2. To maximize the usefulness of this document, access to the various TIA/EIA (Telecommunications Industry Association/Electronic Industries Alliance), IEEE (Institute of Electrical and Electronics Engineers), BICSI, (Building Industry Consulting Service International), NEC (National Electrical Code), NFPA (National Fire Protection Association) Communications Standards, and implementation and installation Manuals for further reference is required. This document assumes that users have communications knowledge and training in all aspects of design, implementation, installation, and testing of a Voice/Data communications system.

3. This document does not address safety issues associated with use. It is the individual's responsibility to use established and appropriate safety and health practices and to determine the applicability of all regulations.

H. Credits

1. Communications Cabling Construction

a. Developed by:

State of Delaware

Department of Technology & Information

801 Silver Lake Blvd.

Dover, DE 19904

2. The content of this document is drawn from experience, as well as other documents and manuals, including the following:

- NEC 2011/2013 Code book

- NFPA-70 Publications
- TIA/EIA Communications Building Wiring Standards
- IEEE Publications & Standards
- BICSI Communications Distribution Design and Installation Publications
- MOTOROLA R56 Standards and Guideline for Communications
- Various Manufactures Publications and Requirements

I. Introduction

1. Any Structured Universal Cabling System installed for the Agencies of the State of Delaware is designed to meet known and anticipated technology needs within the State. An advanced building cabling system provides for more than communication services; it provides an infrastructure for an institution's entire communications network. Instead of being a basic utility, it is as important as the high-tech systems that transmit signals over it and is an integral component of the State's overall information network.

2. These designs provide a universal and flexible cabling system for workstations, conference rooms, and laboratories. Today's cabling system must be multi- functional and provide service for telephones, computers, fax machines, LANs, WANs, broad band fiber optic and coaxial systems (CATV, SATV, CCTV.), Data Centers, computer-aided design workstations, Audio Video systems (AV), and other technologies. For a cabling system to be capable of meeting today's technology and institutional demands, it must have high bandwidth capacity and transmission speed while being extremely flexible.

3. This wiring architecture incorporates the applicable ANSI/EIA/TIA standards, BICSI guidelines and the latest technologies. This cabling distribution plan can integrate all types of systems from a variety of vendors. The design uses a subsystem approach, which allows for changes in the system without affecting other parts of the system. The Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF) Room equipment racks are designed to allow for growth, and the cable routing is accomplished through the provision of cable trays, conduits, sleeves, raceways, and cable hangers where required. Ease of administration and recordkeeping for moves and changes is readily apparent, as is the flexibility that a structured cabling system provides.

4. The wiring medium for the Communications Cable Network consists of Category 6+– 6a 24AWG Unshielded Twisted Pair (UTP) for station cabling and multi pair twisted copper for backbone cabling to support low- speed voice or Data, Category 6+ or 6a for high speed LAN technologies, and 50/125 micron multi-mode fiber optic cable and 50/125 micron multi-mode as well as single mode 8.3/125 micron for even higher bandwidth requirements. The unshielded twisted pair (UTP) Category 6+ or 6a LAN cables can support Data transmission rates of 100, 250 and 500 up to 1000Mb/Sec respectively according to EIA/TIA Standards and manufacturers' specifications.

5. These leading edge components, combined with the open wiring architecture, provide the technology, flexibility, and modularity that allow the system to grow and change to meet changing needs.

6. The central distribution location of the system is the Fiber Optic, coaxial and Copper Main Distribution Frame (MDF) located within the centrally located MDF/IDF Room of each building. Various fiber optic, coaxial and copper riser cables terminate on the MDF and extend to the Communications Rooms/Closets (IDFs) located throughout the buildings. Each building typically has one MDF/IDF Room and a varying number of IDF rooms/closets dictated by the horizontal station cabling limitation of 100 meters for high performance cable. The distance from the information outlet to the termination within the IDF is limited to 90 meters (the permanent link). The IDF room/closet houses the Intermediate Distribution Frame (IDF), Copper and Fiber Optic IDF Patch Panels, Local Area Network (LAN) equipment, and other electronics. Both the riser cables and the horizontal station cables feeding the floor's workstations information outlets terminate in the IDF on Data patch panels, Voice 110 hardware, and Fiber Optic Patch Panels. These termination points act as the cross-connect point between the MDF and the floor that is being served. Large floors are divided into zones, via an imaginary line (within 90 meters of the respective IDF), with each zone being served by its respective IDF room/closet. (See figure 1)

7. Each work area and workstation is served by an information outlet, which provides the jacks for plugging in telephones, computers, broad band coaxial systems, fax machines, modems, and other devices at the desktop. The information outlets are served by varying sets of cables consisting of fiber optic and copper technologies, which originate in the IDF Room. IDF outlets are typically displayed as varying types of triangles (shaded, half-shaded, etc.) on blueprints. (See figure 2)

8. A subsystem architectural approach, using the latest technologies, provides a comfortable level of assurance that the system will support new applications and industry standards as they emerge.

FIGURE 1

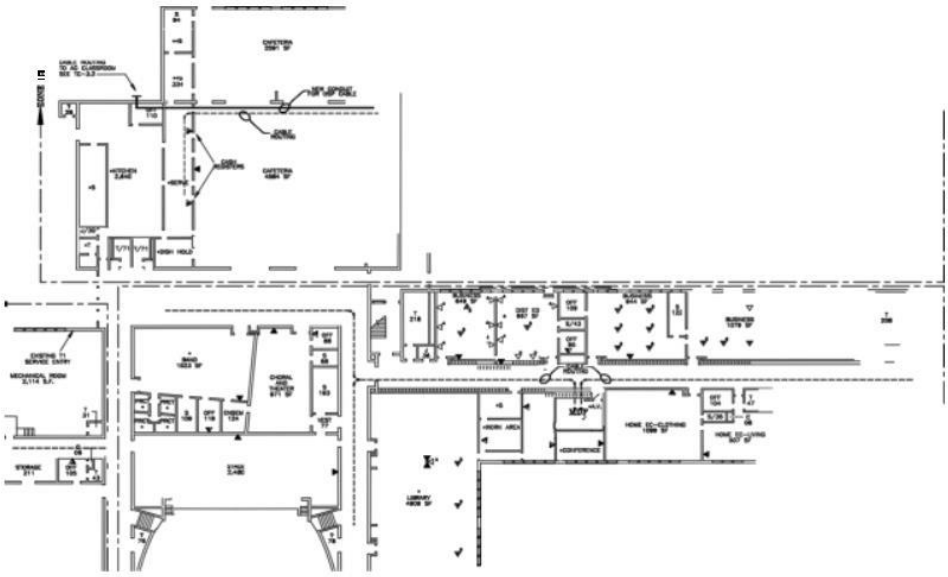
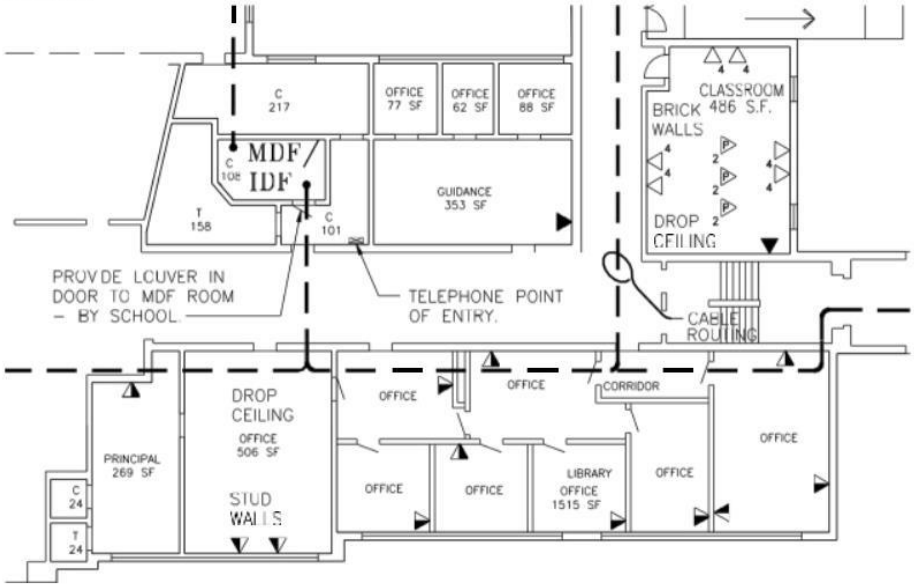


FIGURE 2



J. Procedures

1. Designing a cable system for an institution involves various organizations and individuals and requires a great deal of coordination. Once an institution is designated for wiring, AutoCAD drawings of the floor plans need to be acquired. AutoCAD is a type of computer aided drafting (CAD) format. These files are plotted and converted to blueprints that serve as the working drawings for site surveys and engineering purposes. Based on interviews with the agency's staff and Technical Coordinator will draw triangles on the drawing displaying the locations that information outlets are to be located. Also, tentative locations for the Communications/Data rooms/closets will be marked on the drawings. This information will be approved by the institution’s officials and sent to the engineering team.

2. The engineers will survey the building—floor plans for new construction—and evaluate the communications rooms/closets, plan cable routing, and review the information outlet locations. The necessary adjustments will be made during the site survey, and the engineer will leave the site with the proper approvals from the agency's management if there are major changes such as room relocations.

3. The engineering team will then design the cable system for the building. The end product will be submitted to the agency's Technical Coordinator for comment and/or revision. If no adjustments are necessary, the blueprints are issued to the contractor for construction.

K. Horizontal Distribution System

The horizontal structured cable plant is the portion of the communications wiring system that extends from the information outlet to the Communications/Data room/closet.

1. Horizontal Distribution System General

   a. The horizontal distribution system includes the:

- Information outlet at the workstation
- Cables connecting the workstation to the Communications/Data room/closet
- Intermediate routing and distribution systems

b. The horizontal distribution system should be configured in a star topology. All communications outlets within a work area should be connected to a single Communications/Data room/closet, as defined by the zone concept.

c. This infrastructure must serve all of the Communications requirements of the agency or owner.

d. Communications applications served by the horizontal system can include:

- Voice (e.g., telephones)
- Data (e.g., terminal connectivity, modems, etc.)
- Local area networks (e.g. Ethernet)
- Audio & Video (e.g., CATV, video conferencing and security monitoring)
- Graphics & Imaging

e. When designing a horizontal distribution system, include capacity to satisfy long- term requirements as well as initial plans. Ensure that the distribution system has the flexibility to accommodate necessary moves, additions, changes, and system growth.

f. After construction, the horizontal distribution system is typically difficult to access. Therefore, the time, effort, coordination, and skills required for changes can be extremely costly. In addition, access to the horizontal distribution system frequently causes disruption to the user community.

g. All Horizontal Workstation Communications and broad band coaxial system cabling will be home- run" from the information outlet location to the termination point within the corresponding IDF or MDF/IDF room.

h. Horizontal cable paths will be in a "streets and avenues" manner, typically following main walkways.

i. Horizontal cables are to be fastened onto hangers five feet apart with all cables bundled with tie wraps, and are to have a small amount of slack visible.

j. Cables must be supported by its own support system and not rest on any structures or the hung ceiling. Cables are not to be fastened to ducts, pipes, conduits, or any other existing structures. Cable bundles should be secured to the slab overhead to avoid any conflict with or EMI from flexible electrical conduits, transformers, motors, etc. (Follow the TIA-EIA 569-D.2 Pathways requirements)

k. Some cabling shall run to workstation and other outlets through cavities in the dry wall

and openings in sheet metal or wooden studs within the dry wall construction. The sheet metal studs will not have gaskets for this purpose, so it is the Contractor's responsibility to exercise extreme care in snaking cable through these areas, so as to avoid damage to the cable jacketing.

l. The building's horizontal wiring plan is to be installed on all floors from the information outlet to the termination point within the associated IDF Room.

m. Horizontal cable will be installed onto “J” hooks (similar to B-Line BCH series) or equivalent in the ceiling or tops of walls near ceiling. Cables are to be fastened to “J” hooks or equivalent every 5 feet. The cable contractor is to provide and furnish the “J” hooks.

n. All station cable (horizontal) and tie cables that run from relay racks to the wall- mounted frames are to be plenum-rated.

2. Horizontal Communications Cable Specification

a. For each type of information outlet indicated on the attached drawings, the contractor shall furnish all of the following equipment, install it in the correct configuration, and test it.

b. All cabling, outlets, and termination patch panels used for the Category 6 data system must be provided by a single manufacturer and shall be certified as part of the 25 year minimum warranty- Where the installer chooses to use one (1) manufacturer for cabling and a different manufacturer for the outlets and termination patch panels for the Category 6 data system, the two (2) manufacturers must prove to have compliant interconnecting hardware and shall be certified as part of the 25 year minimum warranty.

c. All Category 6 UTP & Fiber cabling is to be handled and terminated in accordance with the Manufacturer’s Premises Communications Application and Installation Guide.

d. In addition to the above manufacturer’s standards, all applicable ANSI/TIA/EIA-568-C Category 6 and Fiber Optic Cable standards are to be strictly adhered to.

e. The fiber optic cable is to be terminated on both ends with an LC type connector on the patch panels.

f. The contractor is to use Plenum cable for all station 4-pair copper, and 12-strand fiber cabling.

g. Plan routes to ensure that the proposed route on the plans falls within the EIA/TIA distance limitations (90 meters after termination) for horizontal cabling.

h. Cables serving information outlets that cannot be routed down wall cavities will be enclosed in latching surface-mount raceways, anchored (not with adhesives) to walls. Contractor will provide all raceway fittings to allow for level and plumb routes from ceiling to information outlet. Proper fill ratios must be observed. Contractor may reference the manufacturer’s catalogs or specifications for correct fittings and fill ratios. Contractor must use all accessory fittings required in order to build a neat and functional installation. This same method will apply to routing horizontal cables to workstation

outlets where ceilings are not accessible.

i. The IDF Room side of the Category 6a four-pair cables serving a standard outlet will be punched down on individual 110 (Category 6) modular patch panels, 568B wired. The patch panels will be mounted in the relay racks within the IDF rooms.

j. The contractor is to install vertical cable management on the side of all racks.

k. In locations that have wall-mounted racks, the rack should be hinged to swing out to access the back of patch panels with associated cable management.

l. Contractor is to label both the front and the rear of the patch panels. The terminations are to follow this sequence: Workstation 001A, 001B, 002A, 002B. It is acceptable to change numbering for floor or closet designation.

3. Zones

a. A zone is a contiguous area in which all horizontal wiring is homed to a single communications closet within 90 meters from the IDF.

b. To maintain an orderly, understandable wiring system, it is imperative that the horizontal distribution system be structured in zones.

c. Within a zone, all communications wiring is run to a single communications closet.

d. Other zones use different Communications/Data rooms/closets. Cross-zone horizontal wiring is prohibited. Connections between zones are provided via the vertical distribution system.

L. Communications/Data Rooms/Closets (General)

1. The Communications/Data room/closet is a concentration point for communications and LAN services. In this room, premise wiring and cabling are terminated and cross-connected. In addition, active networking devices such as switches are placed here. Communications/Data rooms/closets provide a safe area for housing distribution cabling, premise equipment, and termination fields. These rooms/closets are a focal point for communications services.

2. In addition to supporting in-house connectivity, the MDF Communications/Data room/closet often provides a termination point for the local telephone company. The entrance facility, or demarcation point (de-mark), is the location where outside communications services, such as copper telephone lines, fiber optic Data circuits, and CATV, are delivered to the building. Typically, distribution of communications services within the building originates at this point and is the responsibility of the owner.

3. Special considerations must be given when providing the building entrance pathways for the copper, fiber optic, and coaxial cables that service providers will install in to the building de-mark. It is the owner’s responsibility to provide this pathway into the building. Contact DTI for standards and specifications for building entrances.

4. The following section details the basic requirements for a Communications/Data room/closet.

It may be used to assist in:

- Designing new Communications/Data rooms/closets
- Assessing and refining existing Communications/Data rooms/closets to support evolving communications requirements.

5. Design Guidelines: The suggested building practices put forth in this section are recommendations and are subject to field conditions and budget constraints. Local building and electrical codes, practices and requirements may supersede the guidelines presented in this section.

   a. Sizing of Communications/Data rooms/closets

      - The Communications/Data room/closet must have enough space to support required communications systems, including projected growth.
      - The existing system is likely to be replaced in the future
      - A new system may, require more (or less) space
      - The existing system and a new system may need to coexist during a cut-over

   b. Location of Communications/Data rooms/closets

      - Communications/Data rooms/closets should be situated so as to minimize the length and the quantity of cable runs needed for the distribution systems.
      - The maximum horizontal distribution cable distance must be less than 90 meters (295 ft.), independent of media type. This distance represents the cable length from the mechanical termination of the media in the Communications/Data room/closet to the outlet in the work area. This is known as the permanent link.
      - Vertical (backbone) distribution system distance limitations vary and are dependent upon media, topology, and facility issues.

   c. Unacceptable locations for Communications/Data rooms/closets:

      - Anywhere water vapor exists, such as boiler rooms, washrooms, or janitor's closets.
      - Spaces with corrosives, explosives, and combustibles, including acid, ammonia, chlorine, oxygen, and petroleum vapors.
      - Spaces containing steam pipes, drains, or clean-outs.
      - Areas with high traffic volumes (for security reasons, as well as to minimize the risk of inadvertent damage) unless separately enclosed.
      - Areas of high electromagnetic interference (EMI) or radio frequency interference

(RFI). Both adversely affect system performance and reliability.

6. General Room Requirements

   a. Electrical

      - All active Communications, Data and Video systems have specific electrical power requirements. Plan electrical service to ensure smooth installation, reliable service, and compliance with manufacturers' warranties. Be sure to consider equipment manufacturer's specifications, National Electric Code (NEC) requirements, State and local codes, ordinances, and requirements.

      - Electrical devices capable of causing line transients, such as fans, pencil sharpeners, radios, calculators, and lights, must be separated electrically from the Communications equipment. To accomplish this, all Communications and Data equipment requires separate electrically isolated ground circuits and/or building grounding. The outlets on these circuits should be labeled and/or color coded. Frequently, orange-colored wall outlets are used to identify power sources used for computing and communications equipment. Utility outlets are also needed in the Communications/Data room/closet for tools, test sets, and other equipment.

      - Each Communications/Data room/closet shall have one 110V, 15 Amp electrical convenience outlet and one 110V, 20 Amp dedicated-circuit electrical outlet for the electronic equipment. This is a minimum requirement based on the typical current draw of the networking equipment to be placed. The 110V 20 Amp dedicated circuit isolated ground electrical outlet(s) should be mounted in convenient location to facilitate the use of the shortest equipment power cords. The recommended location is at the top of the rack or on the ladder tray.

      - All electrical isolated ground outlets serving Communications and Data equipment must be attached to non-switched circuits to prevent inadvertent equipment shutdown. It is also recommended that they be on a UPS and/or generator if available.

   b. Grounding

      - Most Communications and Data equipment requires bounding and grounding of equipment cabinets. Do not use plumbing or conduit (EMT) fixtures as a ground source. Grounding shall meet the NEC and EIA/TIA requirements and practices except where other authorities or codes impose more stringent requirements or practices. (Refer to NEC Chapter 2 article 250 and Chapter 8 Communications Systems, TIA/EIA Standard J-STD-607-D and Motorola R56 Standards and Guideline for Communication site).

      - In addition to protecting personnel and equipment from hazardous voltages, the grounding system may reduce the effect of electromagnetic interference (EMI) throughout the structured cable plant. Improper grounding can result in induced currents that disrupt Communications circuits.

      - Ensure that the installation conforms with applicable regulations and practices

- Ensure that each Communications/Data room/closet has an appropriate ground buss bar

- Ensure that grounding is available for cross-connect frames, patch panel racks, Telephone and Data equipment, as well as testing and maintenance equipment

c. Space

- A distance of three feet is the preferred clearance from the front, back, and side of a relay rack.

- If there are space constraints, it is acceptable to provide a minimum of two feet of clearance on one rack side for access and a minimum of two feet of front and back clearance for cross-connect fields, patch panels, etc. If possible, locate sleeves, cores, slots, and/or conduits together in one area to maximize usable wall space.

d. Rooms/Closets Sizing

- Determine the number of relay racks required for the termination of patch panels and electronic equipment. Assume that free-standing relay racks will be installed and provide three feet of space on all sides of each.

- Determine the amount of wall space that will be required for the installation of termination equipment. A minimum of four feet should be used as a criterion.

- Determine if the plywood backboard will be furred-out. This equals approximately 4” of space taken from the room.

- Take into account the door swing if the door opens into the room. Ideally the door should open out from the room.

- Determine how much space any sleeves, conduits, or other equipment require.

- Determine the size of the room by constructing a diagram, to sale, of all of these components, taking into account all the walkways and door swings.

- If a very small number of information outlets are being installed, the minimum size a closet can be is 4’ wide and 3’ deep. This assumes a 4’ X 8’X 3/4” plywood backboard, one wall-mounted relay rack that has a fiber optic patch panel, copper patch panels, coax patch panel, LAN hubs and ground buss bar. It is recommended to install plywood on all walls, from the floor to the ceiling.

e. Structural Walls

- Extend from the floor to the deck above (fire wall)

- Be securely fastened to the floor and the deck above

- Conform to national and local construction guidelines

f. Wall Linings

- Each Communications/Data room/closet will contain a minimum of one furred-out or flush sheet of plywood (4’ X 8’) mounted on the wall.
- It is recommended to install plywood floor to ceiling on all walls.
- Securely fasten the plywood to wall framing members to ensure that it can support any attached equipment.
- The plywood is to be 3/4”, A/C grade, and fire-retardant.
- All plywood backboards are to be mounted smooth side out and painted white at time of installation, prior to installation of equipment onto the plywood.

g. Floor Finish

- Keep dust to a minimum in Communications/Data rooms/closets.
- Anti-static Asphalt Tile, Linoleum Tile, or Sealed Concrete is acceptable floor finishes.

h. Ceilings and Doors

- Dropped ceiling height should be at least nine feet from the finished floor to provide adequate space for equipment cabinets and suspended cable trays. Some equipment may require additional height, depending on the manufacturer's specifications. Avoid installing false ceilings in small closets.
- Overhead ceiling vents should be centrally located to maximize air distribution and maintenance access. Avoid placing overhead ceiling vents directly over suspended racks and equipment cabinets.
- All ceiling vents should have diffusers (vent manifolds) securely installed.
- Design doorways with minimum measurements of 36 inches wide. Hinge the doors to open outward.
- All Communications/Data rooms/closets should have door locks and a minimum number of windows, if any. Closets should be kept locked. Provide keys to select personnel who are on- site continuously.

i. Lighting

- Within ceilings, position light fixtures at least eight feet above the finished floor.
- Indirect (reflected) lighting is not recommended.
- If possible, minimize heat and glare by using fluorescent light fixtures with protective covers instead of incandescent fixtures.
- Do not place light fixtures where the light may be blocked or filtered.

- Typically, light fixtures should not be directly above or within 12 inches of cabling, equipment cabinets, termination frames or other free-standing equipment.

- Install light fixtures on power circuits separate from those used for communications equipment.

j. Communication/Data Room/Closet Environment

- Manufacturers of most hardware recommend a room environment consisting of a temperature between 72–75° Fahrenheit and a 45–50% humidity level.

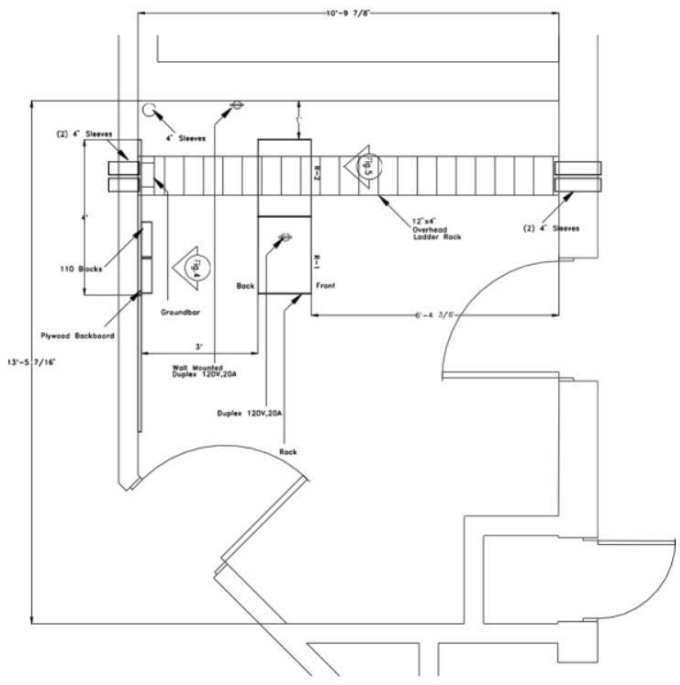
- It is recommended that temperature swings do not exceed 10° and humidity remain within a ±5% range.

7. MDF Requirements

a. An MDF Room is a specialized communications closet that may house major communications systems, such as a communications processor, switch and routing equipment. The MDF Room is generally considered to be distinct from an IDF Room because of the complexity of the equipment it contains.

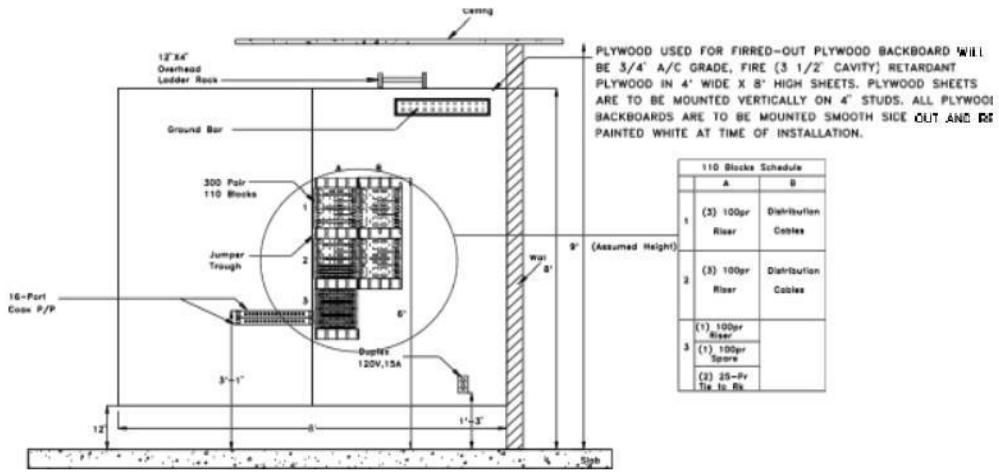
b. A typical Main Distribution Frame (MDF) Room is composed of a wall-mounted plywood backboard and relay racks designed for mounting termination equipment and electronics (see Figure 3). Most MDFs within the building cabling system also serve as an IDF. This is accomplished by providing separate relay racks for each and delineating the wall-mounted frame's 110 blocks for Station cabling (see Figure 4 and Figure 5).

FIGURE 3



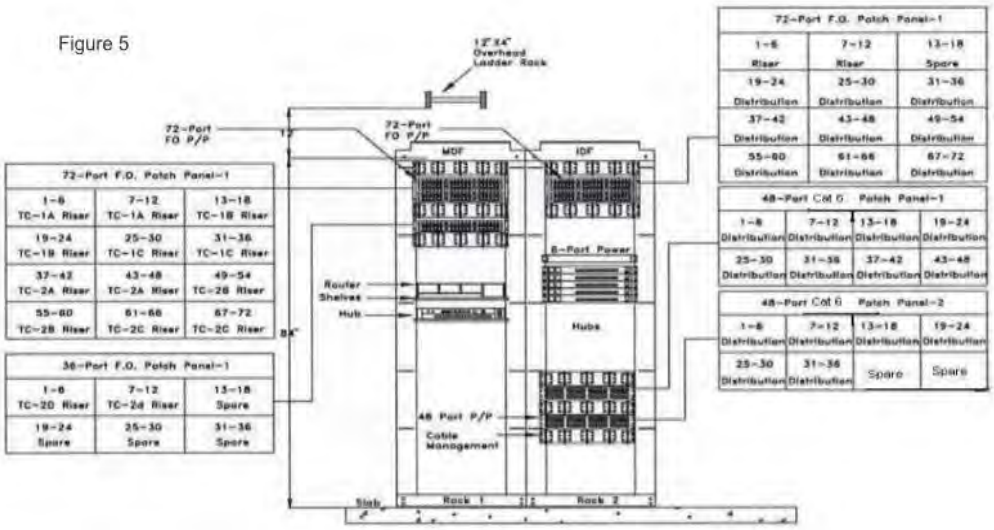
Main Distribution Frame Room Layout
NOT TO SCALE

FIGURE 4



Main Distribution Frame Voice Elevation
NOT TO SCALE

Figure 5



Main Distribution Frame
Data Rack Elevation
NOT TO SCALE

c. MDF/IDF Room Equipment Enclosures

- Any MDF/IDF Rooms located in rooms that are shared with space used for any other

purpose should have wire mesh cages or sheetrock walls around the Communications equipment, or the equipment should be installed in a lockable cabinet.

d. Environment

- Environmental control equipment must function properly at all times. If the building system cannot ensure continuous operation on weekends and holidays, provision of stand-alone control units for the MDF/room and IDF room/closet is necessary.

- Within the MDF room and IDF room/closet, temperature should not vary by more than 5°F, and humidity must not vary by more than 10%. Measure temperature and humidity five feet above the finished floor in the center of the communications room/closet.

e. Local Exchange Carrier (LEC)

- Placement of Communications equipment may be influenced by vendors and service providers. For instance, the LEC (local phone company) may decide to terminate the Central Office (CO) service directly into the equipment space provided or request termination space other than that offered by the customer. If they request termination at a point other than that requested by the customer, the LEC should provide reasonable explanation.

- The LEC, CATV, and most service providers will require a conduit entrance in to the building to provide their service. The minimum requirements are two (2) four- inch conduits for the LEC and one (1) four-inch conduit for each other service provider, unless they specify otherwise in writing.

- It is critical that the high speed Data line, TLS – Canoga Perkins and Fiber Optics be located in the MDF room. This will ensure security and simplify troubleshooting.

- The LEC may also need space for distribution systems terminations (either horizontal or vertical) and patch cable terminations.

f. Other Equipment Vendors

- As with the local phone company (LEC), it is vital to consult with all Communications equipment manufacturers for their specific space and operational requirements, such as the telephone system and Data LAN/WAN equipment provider.

g. Relay Racks

- Each MDF will contain one 4-post server rack, model Ortronics, mm10 and two 2-post racks, model Hubbell HUB84RR19 onto which the fiber optic/copper patch panels and Data electronics are mounted.

- Each rack shall have vertical cable management of the Hubbel YM1013 or district approved equivalent.

- The relay racks should have a minimum of 45 rack units of mounting space on

standard 19” wide rails.

- In some cases, the relay racks are wall-mounted and in others they are free-standing two- or four-post racks. It must be determined which type of rack is required, based on field conditions, equipment manufacturer's requirements, and space allocated.
- All racks are to be grounded and bolted to each other as well as to the slab or wall.
- The rack should have vertical and horizontal cable management to accommodate routing of patch cords.
- There should be a minimum distance of 48” to be maintained from three sides of the rack.
- The relay rack specifications and associated components should meet the requirements of the equipment that will be installed in it.
- It should be at a minimum 84” tall with 6” rails, with 19” equipment mounting space and vertical and horizontal wire management.
- Manufactured by Hubbell of Eaton/B-Line, Panduit or approved equivalent

h. Wall-mounted Relay Racks

- The rack is to be securely fastened to the wall behind it and attached to the ladder rack above.
- The rack should be sized to accommodate the equipment to be installed in it, with vertical and horizontal jumper management.
- Manufactured by Hubbell of Eaton/B-Line, Panduit or approved equivalent

i. Communications Cabinets

- All communications cabinets are to be grounded to the grounding and bounding system and bolted to each other and to the slab.
- Each communications cabinet is to be installed with its side to an adjacent wall. Three feet of clearance around the cabinet is recommended and the cabinets must have front and rear.

j. Data Equipment Cabinets

- Data equipment cabinets should conform to the State Data Center Standard as follows:

Cabinet size	30”Wx44.30’Dx79.’H
Rack units	42 rack units for equipment mounting
Mounting rails	Two pair 19" adjustable depth universal mounting

Mesh steel doors	Single front and split rear with locking handles
Vertical cable	Trough, rings or VeLCro tie downs or combination of, mountable management left or right side
PDU mounting	Space to mount two horizontal PDU closest to equipment mountable top or bottom, together or separate
PDU Metering	Managed or Metered PDU's to display Amperage, Voltage
Side panels	Removable, solid, both sides
Top	Solid with cabling access opening capabilities
Bottom if required	Solid with cabling access opening capabilities

- Cabinet should have grounding, bounding and anti-tip capabilities that can be added when required.
- Approved cabinet Manufacturer: Eaton Wrightline RS Series or approved equal

k. Cable Trays

- Between the relay rack and the wall-mounted frame, a 12" cable tray (center-rail systems are not permitted), with a 4" load depth and 6" rung spacing is to be installed suspended from a ceiling support structure, mounted to the relay rack and the wall.
- Do not attach any cable tray to a suspended ceiling grid.
- An open wire basket cable tray system is acceptable for cable support.
- Approved manufacturer: Cooper B-Line part # FT4X12X10 or approved equal

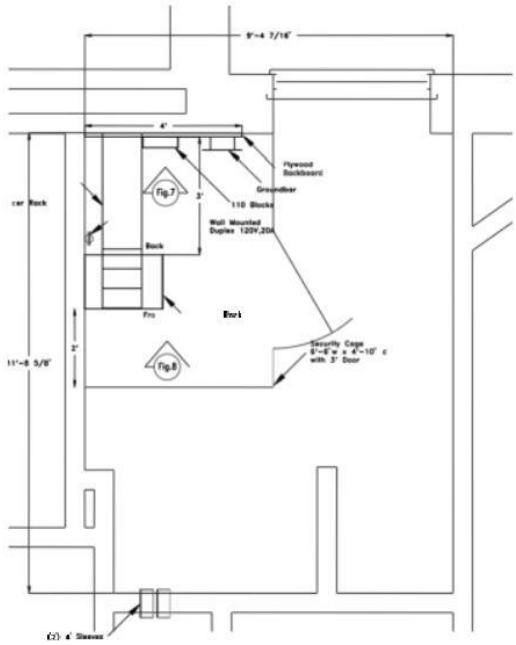
l. MDF Room Electrical Requirements

- Each room shall have a minimum of one duplex dedicated 20 Amp isolated ground circuit and one shared 20 Amp circuit.
- Larger equipment loads may require additional circuits.

8. IDF Room Requirements

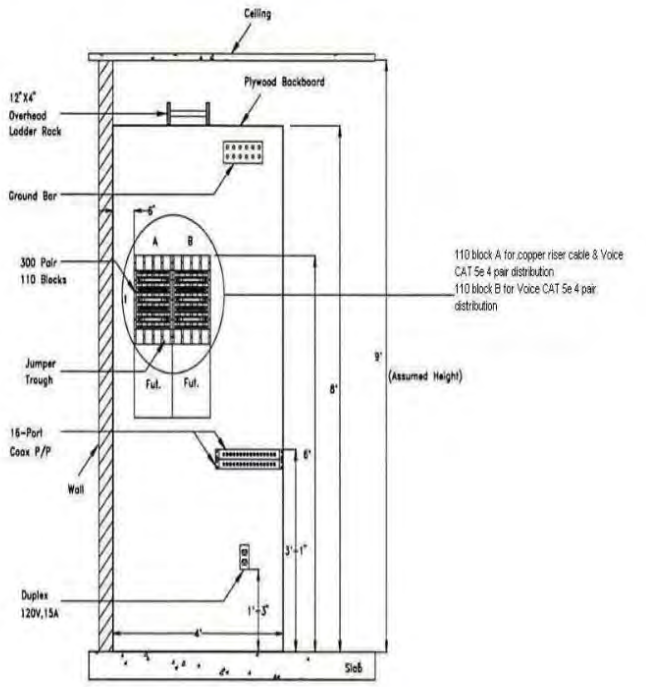
a. Each IDF Rooms within a building supports all connections in single, contiguous area (zones). Cross-zone wiring is not to be installed from user workstations. Connections between zones are made through backbone wiring systems, which link the IDF Rooms to the MDF. A typical Intermediate Distribution Frame (IDF) Room is composed of a wall-mounted plywood backboard and relay racks designed for mounting termination equipment and electronics.

FIGURE 6



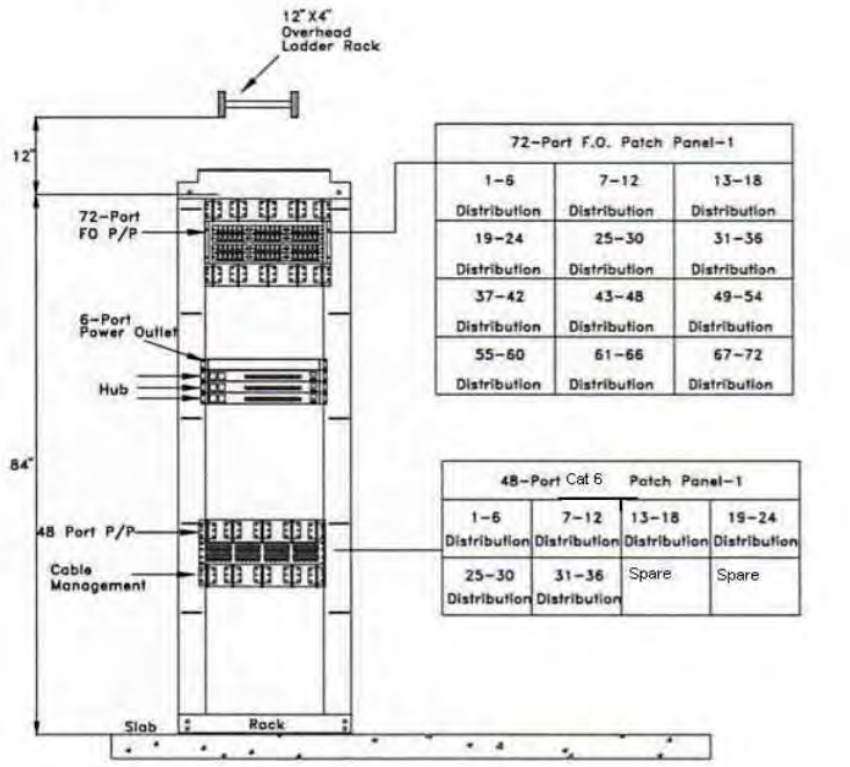
Sample IDF –TELECOMMUNICATIONS CLOSET LAYOUT
NOT TO SCALE

FIGURE 7



Sample IDF –Telecommunications Closet Elevation
NOT TO SCALE

FIGURE 8



Sample IDF –Telecommunications Closet
Data Rack Elevation
NOT TO SCALE

b. Number of IDF Communications/Data rooms/closets within a building

- Each floor should have at least one IDF Communications/Data room/closet.
- Wiring workstations to IDF Communications/Data rooms/closets on different floors is not a preferred practice but can be done if no alternative exists.
- If possible, IDF Telecommunication Closets should be positioned toward the center of the building (usually the core area) and stacked vertically, when possible, in multi-story buildings.

c. Plywood Backboard

- Each IDF Room will contain a minimum of one 4’ X 8’ sheet of plywood flush-mounted on the wall.
- Securely fasten the plywood to wall-framing members to ensure that it can support attached equipment.
- The plywood is to be 3/4”, A/C grade and fire retardant.

- All plywood backboards are to be mounted smooth side out and painted with white fire-retardant paint at time of installation and prior to installation of equipment onto the plywood.

d. IDF Room Equipment Enclosures

- Any IDF Rooms located in rooms that are share space used for any other purpose should have wire mesh cages or sheetrock walls around the Communications equipment.

e. Relay Racks

- Each MDF will contain a minimum of one 19”W X 7’H Relay Rack onto which the fiber optic/copper patch panels and Data electronics are mounted.
- Each rack shall have vertical cabler management of type Hubbell VM1013 or District approved equivalent.
- The relay racks should have a minimum of 42 rack units of mounting space on standard 19” wide rails.
- In some cases the relay racks are wall-mounted and in others they are free-standing two- or four-post racks. It must be determined which type of rack is required, based on field conditions, equipment manufacturer's requirements, and space allocated.
- All racks are to be grounded and bolted to each other as well as to the slab or wall.
- The rack should have vertical and horizontal cable management to accommodate routing of patch cords.
- The relay rack specifications and associated components should meet the requirements of the equipment that will be installed in it.
- It should be at a minimum 84” tall with 6” rails, with 19” equipment mounting space and vertical and horizontal wire management.
- Manufactured by Hubbell of Eaton/B-Line, Panduit or approved equivalent

f. Wall-Mounted Relay Racks

- The rack is to be securely fastened to the wall behind the rack and attached to the ladder rack above.
- The rack should be sized to accommodate the equipment to be installed in it, with vertical and horizontal jumper management.
- Manufactured by Hubbell of Eaton/B-Line, Panduit or approved equivalent

g. Communications Cabinets

- All communications cabinets are to be grounded to the grounding and bounding

system, bolted to each other and to the slab.

- Each communications cabinet is to be installed with its side to an adjacent wall.
- Three feet of clearance around the cabinet is recommended, and the cabinets must have front and rear access.

h. Cable Trays

- Between the relay rack and the wall-mounted frame, a 12” cable tray (no center rail systems), with a 4" load depth and 6" rung spacing is to be installed suspended from a ceiling support structure, mounted to the relay rack and the wall.
- Do not attach cable trays to the suspended ceiling grid.
- An open wire basket cable tray system is acceptable for cable support.
- Manufactured by Hubbell of Eaton/B-Line, Panduit or approved equivalent

i. IDF Room Electrical Requirements

- Each Communications/Data room/closet shall have one 110V, 15 Amp electrical convenience outlet and one 110V, 20 Amp dedicated–circuit, isolated-ground electrical outlet for the electronic equipment.
- This is a minimum requirement based on the typical current draw of the networking equipment to be placed.
- The ground for the equipment outlet should be isolated where possible to avoid line transients.
- The 110V 20 Amp dedicated-circuit, isolated-ground electrical outlets should be mounted in convenient location to facilitate the use of the shortest equipment power cords.
- The recommended location is at the top of the rack or on the ladder tray.
- All electrical isolated ground outlets serving Communications and Data equipment must be attached to non-switched circuits to prevent inadvertent equipment shutdown.
- It is also recommended that they be on a UPS and/or generator if available.

M. MDF & IDF PRODUCT SPECIFICATIONS

1. Category 6 Patch Panels: In new construction projects, the default cabling infrastructure shall be Category 6 unless specified otherwise.

a. Category 6 Patch Panel Requirements

- Category 6 patch panels shall be standard 8-position, RJ-45 style, un-keyed, in 48-

port configurations.

- Panel frames shall be 14-gage steel with rolled edges top and bottom for proper stiffness.
- Panel design shall incorporate plastic push-fasteners to permit hands-free positioning onto standard EIA-310-D 19” mounting rails.
- Panels shall accommodate a minimum of 24 ports for each rack mount unit (1 RMU = 1.75 in.).
- Panels shall be designed for 4-pair, 100 ohm balanced unshielded twisted pair (UTP) cable.
- Panels shall terminate 26-22 AWG solid conductors, with maximum insulation diameter of 0.050 in.
- Panels shall have attached wiring instruction labels to permit either T568A or T568B wiring configurations.
- Panels shall have individual port identification numbers on the front and rear of the panel.
- Panel adapter modules shall be 110-style termination with tin lead solder plated IDC contacts.
- Printed circuit boards shall be fully enclosed front and rear for physical protection.
- Panel contacts shall withstand a minimum of 2000 mating cycles with an FCC 8-position RJ-45 plug, without degradation of electrical or mechanical performance.
- Panel contacts shall be constructed of Beryllium copper for maximum spring force and durability.
- Contact plating shall be a minimum of 50 micro-inches of hard gold in the contact area over 50 micro-inch of nickel.
- Panel termination method shall follow the industry standard 110 IDC punch-down, using a standard 110 impact termination tool.
- Panels shall be compatible with a 4-pair multi-punch impact termination tool designed specifically for the purpose. Bending or other damage to the panel using a multi-pair punch tool shall not occur.
- IDC contact termination towers shall have tapered pair-splitting features to aid wire insertion and minimize pair un-twist.
- IDC contacts shall be Phosphor Bronze with 100 micro-inch tin lead 60/40 plating over nickel.
- Panels shall not require special cords or special installation requirements.

- Panel ports shall accept optional hinged dust covers and port identification icon buttons.
- Space above the adapter ports shall be available for additional labeling per ANSI/TIA/EIA-606-A.
- Category 6 panels shall be backward compatible with existing Category 3, 5, and 5e cabling systems for fit, form, and function.
- Panels shall accept a clip-on rear cable management support bar to provide cable strain relief.

b. Category 6 Patch Panel Performance Requirements

- All transmission performance parameters shall be independently verified by a UL or ETL third party testing organization.
- Category 6 panels shall meet or exceed Category 6 transmission requirements for connecting hardware, as specified in ANSI/TIA/EIA-568-C.2 Transmission Performance Specifications for 4-Pair 100 ohm Category 6 Cabling.
- The manufacturer shall provide Category 6 component compliance certificates from third party testing organizations upon request.
- Panels shall be UL LISTED 1863 and CSA certified.
- Panels shall support 4PPOE IEEE 802.3bt Power specification to 1.5 times the rated current limits with no degradation of performance or materials.
- Panel contacts shall withstand a minimum of 2000 mating cycles with an FCC 8-position RJ-45 plug, without degradation of electrical or mechanical performance.
- Panels shall be third party verified, error free Gigabit Ethernet performance to IEEE 802.3 standard.
- Category 6 panels shall meet the current draft 10 Gb/s performance requirements of IEEE 802.3an and TSB-155, for a maximum 55-meter channel length. Conditions of requirement No. 10 above apply.

c. Acceptable Manufacturers:

- Hubbell Premise Wiring: The Hubbell products listed in the table below comply with all requirements specified in this document

HUBBELL CATALOG NUMBER	Description
P6E48U	NEXTSPEED® Category 6 Patch Panel, 48-Ports
PCBLMGT	Rear Cable Management Bar

- Or approved equal of: Ortronics, Panduit, Systimax.

d. Category 6 Patch Panel Installation Requirements

- Horizontal and backbone cabling of the proper category shall be fully deployed into the TR, TE, or ER according to applicable codes and standards.
- Cable slack, service loops, bend radii, and pathway fill ratio shall comply with applicable codes and standards.
- Racks, cabinets, enclosures, and metallic cable pathways shall be bonded to an approved ground according to ANSI-J-STD-607-A.
- Cable ends for termination shall be clean and free from crush marks, cuts, or kinks left from pulling operations.
- Properly mount patch panels into the designated rack, cabinet, or bracket locations with the #12-24 screws provided.
- Terminate cables into the patch panel according to manufacturer's instructions.
- To maximize transmission performance, maintain wiring pair twists as close as possible to the point of termination.
- The length of wiring pair un-twist in each termination shall be less than 0.5 inches (13 mm).
- Horizontal or backbone cables extending from the panel terminations shall maintain a minimum bend radius of at least 4 times the cable diameter.
- Cable terminations shall have no tensile or bending strain on panel IDC contacts in each installed location.
- Panels shall be properly labeled on front and back with the cable number and port connections for each port.

2. Fiber Enclosures, Adapter Plates, Connectors

a. Fiber Adapter Enclosure Requirements

- Enclosure design shall be a modular, rack-mounted, powder coated formed cold rolled steel enclosure with a removable front cover, rear panel, top panel, and slide-out inner tray.
- Each basic unit delivered shall consist of: (1) enclosure assembly, (2) mounting brackets, (6) cable ties, (5) snap-in cable clips (4) #12-24 mounting screws, (1) adhesive grid label, (4) adhesive cable clips, (2) Velcro cable ties, (3) label holders, and (1) splice tray stud, wing nut, and spacer.

- Material shall be as follows:

  (1) Enclosure, panels and tray: 16-gauge cold rolled steel (CRS)

  (2) Mounting brackets: 14 gage CRS

  (3) Front cover: Acrylic (Plexiglas)

- Basic dimensions of the enclosures shall be approximately 17” wide by 12” deep.

- Enclosures shall be available in heights of 3.5” (2 RMU), 5.25” (3 RMU), and 7” (4 RMU) versions.

- Finish shall be black durable powder coat on all surfaces.

- Front door shall be Lexan plastic, hinged at the bottom, with a cap-plugged hole to accept an optional lock. Front door shall also be removable in the fully open position by sliding left off the mounting pins.

- Front door shall be secured in the closed position with magnetic quick-release latches.

- Top cover shall be removable in the forward direction, without fasteners, to provide access to the connector field. Top panel shall also have knockouts for backbone cable entry.

- Rear panel shall be removable without fasteners.

- Enclosure shall be equipped with panel-mounting brackets assembled for 19” rack mounting, compliant to ANSI/EIA-310-D.

- Panel mounting brackets shall be configurable to either 19” or 23” racks.

- Enclosure chassis shall have two mounting bracket locations for either flush mount or center mount on the rack.

- Rear of enclosure shall have two knockouts, top and bottom, for backbone cable entry and internal routing.

- Front of enclosure chassis shall have side cutouts for patch cord entry into, and exit from the enclosure.

- Inner tray shall slide out in the forward direction by releasing the lever-action quick-release latches. Tabs in the chassis shall engage with slots in the inner tray in the outward position to prevent tray from falling out.

- Inner tray shall have rear-located knockouts to match rear chassis knockouts.

- Inner tray panel mounting posts shall accept modular adapter panels, in high- or low-density versions. Adapter panels shall be available in singlemode.

- Splice tray mounting boss shall also accept a stud for mounting blown fiber adapter brackets.
- Inner tray shall have clips for cable ties, and holes to accept snap-in cable clips, front and rear, for complete cable management of patch cords and distribution cable strands.
- Inner tray shall have rear cable tie-down features to accept various diameter backbone cables entering the enclosure.

b. Fiber Adapter Panels Requirements

- Fiber adapter panels shall be a modular, quick-fastening steel plate, powder coated to match the enclosure finish.
- Fiber adapter panels shall have pre-installed LC fiber adapters, available in low- or high-density multi-mode or single-mode applications.
- Each individually bagged unit delivered shall consist of: (1) fully assembled adapter panel, with push-pull fasteners pre-installed.
- Adapter panels shall be constructed of 16-gauge cold rolled steel.
- Finish shall be black durable powder coat on all surfaces.
- Basic dimensions of the FSP panels shall be 5.10” length by 1.10” wide.
- Panels shall have two pre-installed, push-pull type quick-release fasteners for quick snap-in installation. Push-pull fasteners shall have an industry standard center distance of 4.65”.
- Panels shall be suitable for mounting either vertically or horizontally.
- Panels shall be available in with LC adapters with precision ceramic alignment sleeves.
- All fiber adapters installed in FSP panels shall have dust caps installed.
- Panels shall be available in low-density and high-density adapter patterns.

c. Fiber Connector Requirements

- Please note OM4 minimum standard

(1) Internal Building Installation

(a) Each IDF will connect back to the MDF with 12 strands of SM fiber.

(2) External Building/Campus Installation

(a) Buildings less than 1640ft/500m shall use a mix of Single Mode fiber.

(b) Installation distances GREATER than 1640ft/500m require use of Single Mode fiber exclusively.

- Connector basic design shall be a factory pre-polished LC optical fiber connector with a zirconium ceramic ferrule. Integral with the connector body is a wedge-activated fiber clamping mechanism to secure the inserted fiber into a mechanical splice with the factory installed cleaved fiber stub. Index-matching gel is supplied factory-injected into the cleaved fiber stub splice to optimize transmission performance. Connector attachment is achieved without tools, by inserting a field-cleaved optical fiber and then extracting the disposable clamp wedges from the connector body.

- Each basic connector unit delivered shall consist of: (1) connector body with disposable clamp wedge, (1) strain relief boot, and (1) plastic dust cap.

- Connector termination method shall utilize an industry standard multi-layer strip tool and bare fiber cleave tool as the only field tools required.

- LC connectors shall have features to enable field verification using a Visual Fault Locator (VFL) during termination.

- Connector materials shall be designed with thermal stability to comply with environmental requirements of ANSI/TIA/EIA-568-B.3 and TeLCordia GR-1081-CORE.

- Singlemode pre-polished fiber connector materials shall be as follows:

  (1) Ferrule: zirconium ceramic

  (2) LC inner body: thermally stable injection molded thermoplastic

  (3) Dust Cap: nylon or PVC

  (4) Strain relief boot: UL94-V0 molded PVC

- Pre-polished LC connectors shall require no field polishing.

- Colors for specific applications, as designated below:

- Pre-polished OM4 LC connectors shall require no adhesives for termination.

- LC connector internal fiber clamping mechanism shall firmly secure both the inserted glass fiber and the 900 micron buffer layer of the inserted fiber for maximum strain relief.

- All standard mating and interface dimensions for LC connectors shall comply with ANSI/TIA/EIA-604-10 (FOCIS 10).

- Ferrule outside diameter for LC singlemode connectors shall be 1.2483mm to 1.2497mm.

- LC ferrule tip shall have a PC spherical radius of approximately 7.0 mm radius for singlemode versions.
- Delivered connectors shall be individually bagged with the dust cap installed to protect from contamination.
- Delivered connectors shall have the disposable clamp activation wedge element pre-installed onto the connector body.
- Connector design and termination technique shall be independent of cable type or manufacturer, and shall be compatible for either 900-micron buffer or 250-micron buffer distribution cables.
- LC connector strain relief boot shall be a TeLCordia style slotted design for maximum flexural strain relief.
- Strain relief boot shall be yellow for singlemode.
- LC connectors shall be available individually bagged in packs of 12.
- Pre-polished LC fiber connectors, when properly installed onto qualified cable, shall meet the 10 Gb/s Ethernet performance requirements of IEEE802.3.
- Pre-polished LC fiber connectors, properly installed onto qualified cable, shall exceed the mechanical and environmental performance requirements of ANSI/TIA/EIA-568-C.3, Annex ‘A’.
- Pre-polished LC fiber connectors, properly installed onto qualified cable, shall exceed the mechanical and environmental performance requirements of TeLCordia GR-1081-CORE.
- Qualification test data shall be available from the manufacturer upon request.

d. Acceptable Manufacturers:

- Hubbell Premise Wiring: The Hubbell products listed in the table below comply with all requirements specified in this document.

HUBBELL CATALOG NUMBER	Description
FCR2U6SP	Fiber Enclosure - 2U Rack Mount Fiber Enclosure, Accepts 6 Adapter Panels
FCR2U9SP	Fiber Enclosure - 2U Rack Mount Fiber Enclosure, Accepts 9 Adapter Panels

FCR3U12SP	Fiber Enclosure - 3U Rack Mount Fiber Enclosure, Accepts 12 Adapter Panels
FCR4U15SP	Fiber Enclosure - 4U Rack Mount Fiber Enclosure, Accepts 15 Adapter Panels
FSPLCDS6	Fiber Adapter Panel - 6 LC Duplex, Blue for SM – Zirconia Ceramic Sleeves
FSPLCQS3	Fiber Adapter Panel - 6 LC Quad Blue for SM – Zirconia Ceramic Sleeves
FCLC900KSM12	Fiber Connector - LC, SM, 9/125 UPC – Blue Box of 12

- Or approved equal of: Ortronics, Panduit, Systimax.

e. Fiber Installation Requirements

- For FCR-series enclosures, remove top and rear covers, and front door.
- Punch out the desired knockouts for cable entry.
- Using proper method, pull cables into cabinet through the desired knockout entry location.
- Strip the outer sheath and sub sheaths of the fiber cable to provide at least (2) meters service loop of the individual buffered fiber strands.
- Anchor the outer cable sheath into the rear channel of the inner tray using the cable ties provided. Note: in FCR-series enclosures, leave enough slack in the main cable to allow free motion of the inner tray fully outward. Remove cable entry knockouts as required.
- Installed copper and fiber cabling shall be properly strain relieved. Cable service coil, bend radius, and pathway fill ratio shall comply with applicable codes and standards.
- Use the plastic adhesive-backed clips provided to form the fiber strands into a large service coil on the surface of the inner tray. For FCR-series enclosures, be sure the inner tray has full mobility in and out, with no cable kinks or snags.
- Close inner tray and front cover, and lock the quick-release fasteners.

- Install LC fiber adapter panels by firmly using push fasteners to lock in place.
- Leave dust caps installed in the fiber adapter plates until connector termination is performed.
- Follow manufacturer's termination instructions for pre-polished connectors as specified
- Uncoil the 900-micron buffered strands of cable from the service loop and set-up for termination.
- Un-package the connector, and leave dust cap installed. Firmly press downward on the connector wedge tab to fully seat clamp wedges.
- Slide the strain relief boot onto the fiber strand before stripping.
- Using a fiber strip tool, strip buffered fiber completely to approx. 1.0" of exposed glass fiber.
- CAUTION: Do not nick or Scrape the glass fiber with the strip tool.
- Wipe the glass fiber firmly with an alcohol wipe. Always use 99.9% pure reagent grade alcohol for fiber cleaning.
- Mark the 900-micron buffer layer from the strip-off point per instructions.
- Insert the fiber into the cleave tool and cleave the fiber to the specified length from the end of the 900-micron buffer layer. Always keep the cleave tool clean.
- CAUTION: Always dispose of glass fiber waste in an approved container.
- Gently insert the cleaved fiber into the connector body. Rotate connector slightly during insertion to fully seat the fiber into the internal splice.
- Hold the seated fiber in place using slight force to form a bow in the fiber.
- CAUTION: Do not allow the installed fiber to slip backward.
- While holding the fiber seated, squeeze the wedge holder device to activate the clamp, and then slip the wedge holder off the connector body. Dispose the wedge holder.

- Remove the connector dust cap and inspect the ferrule tip. A 400X microscope is recommended. View of the polished fiber should be a smooth round circle with no scratches, pits, cracks or chips. Use a lint-free wipe to clean off any contamination.
- CAUTION: Do not view ends of live fibers, with or without a microscope.

- Plug the connector into the proper adapter panel and proceed with the next connector. Leave dust cap installed if the connector is not mated.

3. Racks, Horizontal & Vertical Managers

   a. Equipment Racks Requirements

      - Racks shall be a structural aluminum construction, having two 6-inch deep rails.
      - Racks shall feature universal side mounting hole pattern for vertical cable managers.
      - Racks shall feature a weight load capacity of 1,000 lbs. when properly secured to the floor.
      - Each basic rack delivered shall consist of: (2) vertical rails, (2) base angles, (1) assembly hardware kit, (2) top angles, and (20) #12-24 dog point machine screws for panel mounting.
      - Racks shall be available in either for 19-inch standard rack configurations.
      - Tapped holes in the front and rear vertical rails for mounting of panels shall be #12-24 thread size. Powder coat shall not interfere with thread fit.
      - Standard rack heights of 8 ft (96 in)
      - Racks with heights of 8 ft shall have a capacity of 51 rack mount units
      - Rack base angles shall be pre-drilled for floor mounting, and for assembly to vertical rails.

   b. Horizontal Managers Requirements

      - Horizontal Managers shall be 19”W, 3.5”H
      - Horizontal managers shall be 16ga. Cold rolled steel construction with (6) pass thru holes, and (7) Front mounted 3.5” steel rod D-Rings.
      - Horizontal managers shall have hinged Aluminum front cover to conceal patch cords.

   c. Vertical Managers Requirements

      - Vertical cable managers shall be 14”D, 10”W
      - Vertical cable managers shall feature a steel rod construction for increased air flow.
      - Vertical cable managers shall feature a solid aluminum door that is designed to open left or right and swing out of way for cable management.
      - Vertical cable managers shall feature power strip mounting brackets on rear of manager.

- Vertical cable manager shall accept and include (16) 3" black cable management spools.

d. Acceptable Manufacturers:

- Hubbell Premise Wiring: The Hubbell products listed in the table below comply with all requirements specified in this document

- Cooper B-Line: The Cooper B-Line products listed in the table below comply with all requirements specified in this document

HUBBELL CATALOG NUMBER	Description
HPW84RR19D	84”H, 6”D Equipment Rack
HM24C	2U Horizontal Manager w/ 3.5” Front rings and cover
VM1013	Vertical Cable Manager, 14”D, 10”W, with door & cable spools

B-Line CATALOG NUMBER	Description
SB55608419U6	84”H, 6”D Equipment Rack
SB87019S2FB	2U Horizontal Manager w/ 3.5” Front rings and cover
SB860810S084	Vertical Cable Manager, 14”D, 10”W, with door & cable spools

- Or approved equal of: Ortronics, Systimax

N. INFORMATION OUTLETS – DATA & VOICE

1. A work area has at least one standard Information Outlet consisting of Data RJ45 jack. All of the RJ45 jacks shall be Category 6 unless otherwise specified and wired according to the 568B standard.

- DATA & VOICE Cabling Requirement LCenarios

  - DATA PC & VOIP Telephony INFORMATION OUTLET

    - 1x DATA RJ45 CAT 6 Jack per Information Outlet

2. Information Outlet Locations

   a. The location of the information outlets is dependent on the environment in which the outlets will be installed. An office environment certainly is different than a laboratory, training room, or manufacturing area. If the outlets are to be wall- mounted, the bottom of the outlet is to be located 15" above of the finished floor under normal conditions. However, there are many exceptions to this rule. If there is existing equipment that does not allow for this, such as a credenza or countertop, the outlet must be placed at a height appropriate to the situation.

   b. Locate the outlet where it is closest to the equipment and people it will serve. Keep in mind that the cord from the outlet to the device can be a trip hazard or may span across doors. In an office environment, each desk or workstation should have an information outlet. If a particular area has a series of fax machines or modems, then additional outlets should be installed. The number of jacks in an outlet is standard, so to maintain the standard, additional information outlets of the same configuration should be installed; do not install non-standard outlets.

   c. Computer laboratories or training rooms require a large amount of connectivity in odd locations. Power poles are one solution as is the use of surface-mounted raceway or floor-mounted boxes. Each situation is different and must be considered individually. Again, standards are to be maintained in outlet configurations.

   d. When locating an outlet, consideration should be given to the route the cable must take to the information outlet. If the outlet is to be installed on a masonry wall and surface-mount raceway is used for cable routing, the location of the outlet may be more dependent on the path available down or across the wall than where the equipment is located. Each location must be looked at individually to determine if the route to the desired outlet location is possible.

   e. Wall-mounted outlets should not be located on heating units, equipment or ductwork. They are always to be located on either a gypsum, sheetrock, or masonry wall.

   f. A description of the information outlet configurations follows:

      (1) Standard Office Information Outlets consist of: as detailed on the drawings attached to the contract, the contractor will install and terminate four-pair UTP Category 6 for Data cable onto individual RJ45 female jacks.

      (2) Wireless Access Point consist of: as detailed on the drawings attached to the contract, the contractor will install and terminate four-pair UTP Category 6 for Data cable onto individual RJ45 female jacks.

3. Category 6 Jacks: In new construction projects, the default cabling infrastructure shall be Category 6 unless specified otherwise.

   a. Category 6 Jack Requirements

      - Jacks shall be standard 8-position, RJ-45 style, un-keyed, FCC compliant.

      - Jacks shall be designed for 4-pair, 100 ohm balanced unshielded twisted pair (UTP)

cable.

- Each jack shall be single unit construction, with snap – fit to industry standard keystone opening (.760” x .580”).
- Jack housings shall fully encase and protect printed circuit boards and IDC fields.
- Modular jack contacts shall accept a minimum of 2000 mating cycles without degradation of electrical or mechanical performance.
- Jack contacts shall be constructed of Beryllium copper for maximum spring force and durability.
- Contact plating shall be a minimum of 50 micro-inches of hard gold in the contact area over 50 micro-inch of nickel.
- Jack termination method shall follow the industry standard 110 IDC punch-down
- Jacks shall be compatible with a 4-pair single punch impact tool designed specifically for the purpose.
- IDC contact termination towers shall have tapered pair-splitting features to aid wire insertion and minimize pair un-twist.
- Jacks shall terminate 26-22 AWG solid or stranded conductors.
- Jacks shall terminate insulated conductors with outside diameters up to .050”.
- Jacks shall not require special cords, specialty tools or special installation requirements.
- Jacks shall include a translucent stuffer cap for wire retention and to permit visual inspection.
- Stuffer cap shall have retention snaps to assure conductor strain relief.
- Jacks shall accept FCC compliant 6 position plugs.
- Jacks shall accept optional hinged dust covers.
- Jacks shall be compatible with ANSI/TIA/EIA-606-A color code labeling.
- Jacks shall accept snap-on icons for specific identification.
- Jacks shall be available in various colors to meet specific customer applications.
- Jacks shall have attached wiring instruction labels to permit either T568A or T568B wiring configurations.
- Category 6 jacks shall be backward compatible with existing Category 3, 5, and 5e cabling systems for fit, form, and function.

b. Category 6 Jack Performance Requirements

- All transmission performance parameters shall be independently verified by a UL or ETL third party testing organization.
- Category 6 jacks shall exceed Category 6 transmission requirements for connecting hardware, as specified in ANSI/TIA/EIA-568-B.2-1, Transmission Performance Specifications for 4-Pair 100 ohm Category 6 Cabling.
- Category 6 jacks shall exceed 10 Gb/s transmission requirements for connecting hardware, under the constraints of ANSI/TIA-TSB-155 (current draft).
- The manufacturer shall provide Category 6 component compliance certificates from third party testing organization upon request.
- Jacks shall be UL LISTED 1863 and CSA certified.
- Jacks shall exceed IEEE 802.3 DTE Power specification to 4 times the rated current limits with no degradation of performance or materials.
- Jacks shall be third party verified, error free Gigabit Ethernet performance to IEEE 802.3 standard.
- Jacks shall exceed 4 Gb/s data transmission capacity within the bandwidth of 1 – 250 MHz when configured in a 4-connector channel.
- Jacks shall exceed the 4-connector channel performance requirements of Category 6, per the ANSI/TIA/EIA-568-B.2-1 standard.
- Jacks shall exceed the 4-connector Category channel performance requirements for 10 Gb/s transmission over Category 6, according to TIA/TSB-155 (current draft).
- The 4-connector channel test configuration shall utilize Category 6 patch panels and Category 6 patch cords, from the same manufacturer, with qualified Category 6 cable.

c. Acceptable Manufacturers:

- Hubbell Premise Wiring: The Hubbell products listed in the table below comply with all requirements specified in this document

HUBBELL CATALOG NUMBER	Description
HXJ6xx	NEXTSPEED® Category 6 Jack

xx = Jack color. Replace xx with “W” for White, “BK” for Black, “B” for Blue, “GY” for Gray, “GN” for Green, “OW” for Office White, “OR” for Orange, “R” for Red, “Y” for Yellow. Refer to project drawing for color applications.

- Or approved equal of: Ortronics, Panduit, Systimax.

d. Category 6 Jack Installation

- Horizontal cabling of the proper category shall be fully deployed from the TR or TE to each wall plate location according to applicable codes and standards.
- Cable slack, service coil, bend radii, and pathway fill ratio shall comply with applicable codes and standards.
- Metallic horizontal cable pathways shall be bonded to an approved ground according to ANSI-J-STD-607-A.
- Cable ends for termination shall be clean and free from crush marks, cuts, or kinks left from pulling operations.
- Terminate jacks according to manufacturer's instructions.
- To maximize transmission performance, maintain wiring pair twists as close as possible to the point of termination.
- The length of wiring pair un-twist in each termination shall be less than 0.5 inches (13 mm).
- Cable ends for termination shall be clean and free from crush marks, cuts, or kinks left from pulling operations.
- Properly mount patch panels into the designated rack, cabinet, or bracket locations with the #12-24 screws provided.
- Terminate cables into the patch panel according to manufacturer's instructions.
- To maximize transmission performance, maintain wiring pair twists as close as possible to the point of termination.
- The length of wiring pair un-twist in each termination shall be less than 0.5 inches (13 mm).
- Jacks shall be properly mounted in plates, frames, or housings with stuffer cap fully installed over IDC contacts.
- Horizontal cables extending from mounted jacks shall maintain a minimum bend radius of at least 4 times the cable diameter.
- Cable terminations shall have no tensile or bending strain on IDC contacts after assembly of faceplate or housing to the wall outlet.
- Jacks shall be tested as part of the installed horizontal cabling system, with faceplates assembled complete and properly mounted.

- Each link or channel in the horizontal cabling system shall be identified and tested individually, using an industry standard level III tester with correct settings.
- Each jack shall be tested as part of the horizontal channel or link for the parameters listed below.

4. Face Plates

a. Face Plate Requirements

- Faceplates shall be constructed of high impact, UL94 V-0 rated thermoplastic.
- Faceplates shall be 2.75" W x 4.5" H (69.8 mm x 114.3 mm) for single gang and 4.5” X 4.5” (114.3 X 114.3 mm) for double gang.
- Port size in each faceplate shall be industry standard vertical keystone opening size (.760” x .580”).
- Faceplates shall accept Hubbell XJ-series UTP jacks and Snap-Fit fiber optic, audio, and video modules for multimedia applications.
- Faceplates shall provide for ANSI/TIA/EIA-606-A compliant workstation outlet labeling.
- Faceplates shall be provided with clear plastic and color-matched label field covers.
- Color-matched blank Snap-Fit modules shall be available separately to fill unused ports and openings as required.
- Two #6-32 pan head Phillips/slotted mounting screws shall be included with each single gang faceplate.
- Four #6-32 pan head Phillips/slotted mounting screws shall be included with each double gang faceplate.
- Jacks and Snap-Fit modules shall snap firmly into rear of faceplate and position flush to outer plate surface.
- Faceplates shall be compatible with standard NEMA openings and boxes.
- Faceplates shall be compatible with raceway fittings, surface mount boxes, service fittings, flush mount boxes and drywall rings.

b. Acceptable Manufacturers:

- Hubbell Premise Wiring: The Hubbell products listed in the table below comply with all requirements specified in this document

HUBBELL	Description

CATALOG NUMBER	
IFP11xx	1-Gang, 1-Port IFP Face Plate
IFP12xx	1-Gang, 2-Port IFP Face Plate
IFP13xx	1-Gang, 3-Port IFP Face Plate
IFP14xx	1-Gang, 4-Port IFP Face Plate
IFP16xx	1-Gang, 6-Port IFP Face Plate
IFP26xx	2-Gang, 6-Port IFP Face Plate
IFP29xx	2-Gang, 9-Port IFP Face Plate
IFP212xx	2-Gang, 12-Port IFP Face Plate

xx = Face Plate color. Replace xx with "W" for White, "BK" for Black, "GY" for Gray, "OW" for Office White, to project drawing for color applications.

- Or approved equal of: Ortronics, Panduit, Systimax.

O. CABLE ROUTING SYSTEMS

1. Each cable routing system has advantages and disadvantages. Particular systems are favored for a variety of reasons, including architectural considerations, appearances, cost, local ordinances, and material concerns.

2. Various means of distributing cable from Communications/Data rooms/closets to the user work areas are identified in the following:

3. Ceiling Distribution System

   a. A distribution system within an accessible area above a false ceiling. This could either be a plenum area (where there is no enclosed system for cable routing) or an overhead conduit system (which has defined areas of access and routes).

4. "J" Hooks

   a. Where not installed in conduits, cable trays, or other supporting devices, the horizontal wiring plan is to be installed onto "J" hooks or an acceptable equivalent from the information outlet to the termination point within the IDF or MDF/IDF room. The "J" hooks are to be installed a maximum of five feet apart and fastened to the ceiling or the top of the walls near the ceiling. The cables are to be tie-wrapped to the "J" hooks, without crimping the sheath. The cable contractor is to furnish and install the "J" hooks. Cooper B-Line BCM 21, 32, and 64 are acceptable.

5. Sleeves and Conduits

a. The use of conduits and sleeves within a building is common for the transport of communications cable. Conduits and sleeves are to be sized and routes are to be planned within and between buildings in order to route the cable plant from the MDF to IDF and IDF to Information Outlet, and to accommodate any additional cabling required. The sizing of the conduits and sleeves is to be based on the number of cables, the location and environment surrounding the sleeve or conduit, and acceptable conduit fill levels, which are typically 40%. All conduits are to be installed with the appropriate sweep to maintain the required bend radius for copper and fiber optic cable. All sleeves and conduits are to be installed with bushings and suspended according to building industry standards.

b. The following are guidelines to use in determining where sleeves and conduits are to be installed but does not limit nor identify all areas or situations where sleeves and conduits will be required.

- All masonry walls that have cables passing through them are to have sleeves installed.

- Gymnasiums and athletic areas are to have conduits installed to house cables passing through the area.

- Each MDF and IDF Room is to have sleeves installed to contain the large number of cables exiting the room. Conduits are to be installed in areas where cables extend from one building to another via covered or enclosed bridges and corridors.

c. Cable routing is to follow a “streets and avenues” path in corridors where possible. However, there are a number of reasons for exceptions. In some cases, the corridors do not allow cables to be run because of architectural constraints or inaccessible ceilings. Also, in order to maintain the 90-meter standard for Category 6 cabling, some cables need to be run separately and diagonally to isolated information outlets. Throughout all runs, the contractor is to maintain EIA/TIA standards regarding the proximity of communications cabling to high voltage cabling, motors, transformers, fluoreLCent lighting, ballasts, etc.

P. CABLING-GENERAL

1. All cable shall meet the requirements of the NEC, except where other authorities or codes impose a more stringent requirement or practice. Codes, such as the NEC, do not normally include transmission performance requirements. This section specifies the essential media transmission characteristics. It is advisable to consult standards associated with the planned service or equipment to determine any specific media limitations.

2. Contractor is to take all necessary precautions to assure that the maximum tensile load and minimum bend radius of all cables (fiber and copper) are not exceeded. When terminating Category 5e & 6 cable, care should be taken to maintain pair twists up to the termination point and not more than 0.5" of the cable pairs shall be untwisted. It is preferred that the cable sheath is also not removed more than 0.5" from the termination point. Tie wraps are to be hand-tightened on cables and are not to crimp the sheath. Contractor is responsible for protecting all connectorized cables from damage by other contractors at the information outlet before and after installation of the outlet faceplates.

3. All riser and station cable installed is to be plenum-rated cable. The fluoropolymer resin that

insulates Category 6+ plenum cables is engineered as a fire safety innovation. The NEC requires that all cable installed in plenum spaces and not encased in conduit must have certain fire resistance and low smoke producing characteristics. Not only are such cables highly resistant to fire but they also produce very little smoke.

4. All new Voice cabling will be terminated onto Category 6 RJ45 Patch Panels. The fiber optic cabling will be terminated onto fiber distribution panels with LC connectors.

5. Cables shall be terminated on the appropriate unassigned (vacant) portions of the wall-mounted Main and Intermediate Distribution Frames or Patch Panels and run as uninterrupted conductor sections to the Information Outlets. All cable terminations shall be made uniformly in sequence, commencing with termination of the first cable pair on the first connection points in the upper left-hand corner of each block.

6. Minimum separation distances between pathways and power wiring of 480 V or less are shown in Table 1, below.

Table 1 Separation of Communications Pathways from <= 480V Power Lines

	Minimum Separation Distances		
Condition	< 2 kVA	2-5 kVA	> 5 kVA
Unshielded power lines or electrical equipment in proximity to open or nonmetal pathways.	127 mm (5 in)	305 mm (12 in)	610 mm (24 in)
Unshielded power lines or electrical equipment in proximity to a grounded metal conduit pathway	64 mm (2.5 in)	152 mm (6 in)	305 mm (12 in)
Power lines enclosed in a grounded metal conduit (or equivalent- shielding) in proximity to a grounded metal conduit pathway.	76 mm (3 in)	152 mm (6 in)	

All cabling shall be at least:

- 12” from high voltage lighting and fluorescent fixtures
- 72” from transformers and motors

Q. HORIZONTAL CABLING – CATEGORY 6 UTP DATA

All riser and station cable installed is to be plenum-rated cable.

1. Category 6 100 OHM balanced UTP Cable Requirements: In new construction projects, the default cabling infrastructure shall be Category 6 unless specified otherwise.

   a. Cable construction shall be four twisted pairs of 23 AWG insulated solid conductors, with a ripcord, surrounded by a tight outer jacket.

b. All 4 pairs will have a cross-hair (X) physical separator between the pairs.

c. Conductor diameters shall be 0.0224” □ .0003” solid copper.

d. Conductor insulation diameter shall be 0.039” □ .0005” fluoro copolymer.

e. Outer jacket diameter shall be 0.235” □ .008” low smoke PVC, with a nominal wall thickness of 0.015”.

f. Ripcord shall be directly underneath the outer jacket.

g. Cable shall be marked every 2 ft including

- Cable Manufacturer
- Cable Description
- Month and Year of manufacture.
- Job number.

h. UL, ETL, or CSA agency certification or verification markings shall be marked on the cable jacket according to the certifying agency’s requirements.

i. Color coding of the pairs shall be as follows:

- Pair 1: White/Blue; Blue
- Pair 2: White/Orange; Orange
- Pair 3: White/Green; Green
- Pair 4: White/Brown; Brown

j. Cable shall be supplied in 1000 ft spools or 1000 ft Reelex boxes.

2. Category 6 100 OHM balanced UTP Cable Performance Requirements

a. All transmission performance parameters shall be independently verified by a UL or ETL third party testing organization.

b. Cable shall exceed Category 6 transmission requirements specified in ANSI/TIA/EIA-568-B.2-1, and shall be tested through 550 MHz.

c. Worst-case cable performance shall be +8.0 dB headroom over current TIA/EIA and ISO standards limits for NEXT and PSNEXT loss, and ELFEXT and PSELFEXT loss.

d. Insertion loss shall be 3.0% lower than standard Hubbell Category 6+ plenum and riser cables described in Section 27 15 13.

e. Worst case electrical performance characteristics shall be as follows:

- Characteristic Impedance: 100 + 15 (1.0-100 MHz) 100 + 20 (101-250 MHz)
- Maximum Conductor Resistance: 9.38 /100 Meters @ 20°C
- Maximum Resistance Unbalance: 3%
- Maximum Mutual Capacitance: 5.6 nF/100 Meters @ 1 kHz
- Maximum Capacitance Unbalance: 330 pF/100 Meters
- Maximum Delay Skew: 25 ns/100 Meters

f. The manufacturer shall provide Category 6 component compliance certificates from third party testing organization upon request.

g. Cable shall be UL and C(UL) listed.

h. Cable shall exceed IEEE 802.3af DTE Power specification to 4 times the rated current limits with no degradation of performance or materials.

i. Cable shall be third party verified, error free Gigabit Ethernet performance to IEEE 802.3ab.

j. Cable shall exceed the requirements of TIA/TSB-155: 10 Gb/s Ethernet Operation over 55 Meters Channel Length.

k. Cable shall meet or exceed the 4-connector channel performance requirements of Category 6, per the ANSI/TIA/EIA-568-B.2-1 standard.

l. The 4-connector channel test configuration shall utilize Category 6 jacks and patch panels, with Category 6 patch cords, from the same manufacturer, with pre-qualified Category 6+ cable.

2a. Minimum Cable Performance:

a. All measurements are at 250MHz

- Insertions Loss: 32.7dB
- NEXT: 41.4dB
- ACR:8.6dB
- ELFEXT: 23dB
- Return Loss: 17.5dB

3. Acceptable Manufacturers:

a. Hubbell Premise Wiring: The Hubbell products listed in the table below comply with all requirements specified.

HUBBELL CATALOG NUMBER	Description
C6SPxx	NEXTSPEED Category 6 550 MHz – Plenum Spool
C6RPxx	NEXTSPEED Category 6 550 MHz – Plenum REELEX

xx = Cable color. Replace xx with "W" for White, "GY" for Gray, "B" for Blue, "Y" for Yellow. Refer to project drawing for color applications.

b. Or approved equal of: Berk-Tek, Systemax, Panduit

4. Category 6 100 OHM balanced UTP Cable Installation Requirements

a. Pull cable into conduits, or place into raceway or cable tray as specified. Do not exceed 25 Lb. pull force per cable. Use appropriate lubricants as required to reduce pulling friction.

b. All exposed wiring shall be installed in surface raceway.

c. All wiring above ceilings or below access floors shall be installed in cable tray or open-top cable hangers.

d. Cable slack and service loops shall be stored properly above the ceiling or under the access floor. A "figure-eight" service loop is recommended for Category 6 cabling to reduce EMI coupling.

e. Pathway fill ratio in conduit, tray, raceway, etc. shall not exceed 40% of pathway cross-sectional area.

f. Installed cable bend radius shall be greater than 4X cable diameter. Avoid kinking or twisting the cable during installation.

g. Do not over-tighten cable ties, and do not use staples or clamps to anchor cables. Velcro straps are recommended.

h. Recommended spacing of cable supports above the ceiling shall be 48".

i. Maintain the following clearances from EMI sources:

- Power cable: 6 in.
- Florescent lights: 12 in.
- Transformers and electrical service enclosures: 36 in.

j. Communications cabling that must cross power cables or conduit shall cross at a 90-degree angle, and shall not make physical contact.

k. Length of each horizontal cable run from the TR to the wall outlet shall not exceed 90

meters.

l. Leave sufficient slack for 90 degree sweeps at all vertical drops.

m. Do not install cable in wet areas, or in proximity to hot water pipes or boilers.

n. Cable ends for termination shall be clean and free from crush marks, cuts, or kinks left from pulling operations.

o. Installed cable jackets shall have no abrasions with exposed conductor insulation or bare copper ‘shiners”. The installer is responsible to replace damaged cables.

p. Horizontal cables extending from mounted jacks or panels shall maintain a minimum bend radius of at least 4 times the cable diameter.

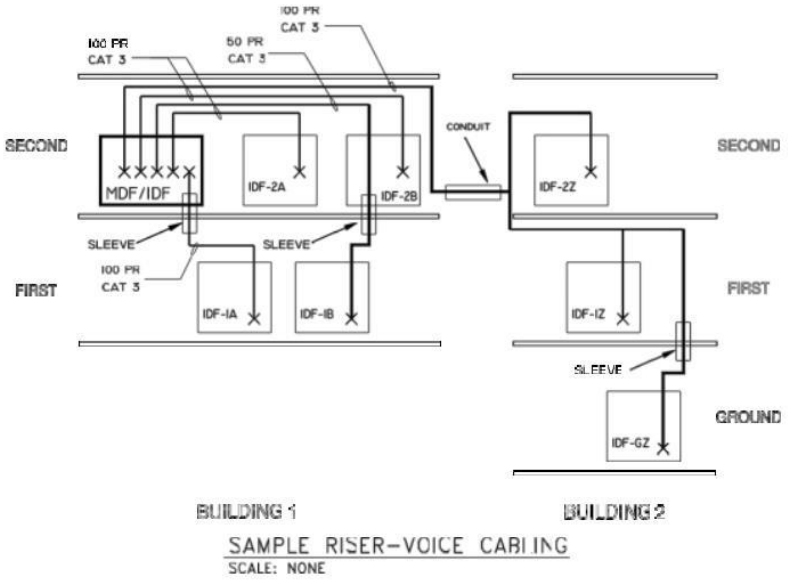
q. Firestop all cable penetrations through fire-rated barriers per local codes.

R. VERITCAL DISTRIBUTION SYSTEMS

1. Riser Connectivity and Cable General

a. The cabling system shall use a fiber/copper riser cable system between the IDF rooms and the MDF within the building.

b. Fiber Riser shall be 12-strand single mode fiber optic cable is to be installed between each IDF and the MDF Room. These cables are to be terminated onto fiber optic patch panels located in the relay racks in each of the IDF rooms and the MDF Room. The 12-strand single mode fiber cable is to be connectorized with LC connectors on both ends.

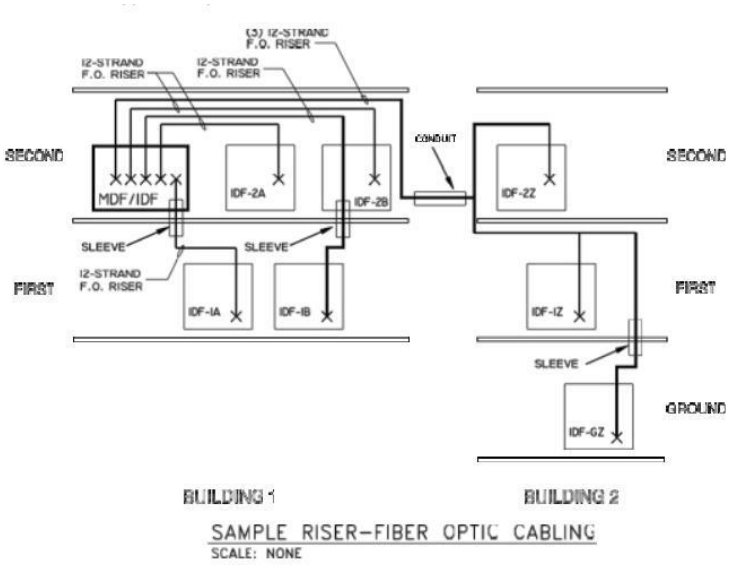


SAMPLE RISER–VOICE CABLING
SCALE: NONE

2. Fiber Backbone Distribution cable: indoor, armored

a. Fiber Backbone Distribution cable Requirements

- Optical Fiber Indoor Distribution Cable shall be constructed with 12 optical fibers, each coated with a 900 micron color-coded PVC tight buffer, surrounded by an aramid yarn strength member, Armored, and a single outer jacket with the appropriate flame rating.
- Fiber cables shall be a non-metallic construction, OFNP (Plenum FT-6) flame rating.
- Cable markings shall repeat every meter, and shall have at minimum the following information:
  a. Sequential length indicator marking (meters)
  b. Manufacturer's name and catalog number
  c. Lot number, traceable back to the fiber draw lot
  d. Date of Manufacture
  e. Fiber type: (Singlemode)
  f. Cable rating (OFNR, OFNP, etc.)
  g. Applicable TeLCordia, TIA, IEC, and ICEA standard references and appropriate UL/CSA agency listings
- Cable jacket color shall be yellow for Singlemode 8.3/125 micron fiber.
- Buffer position color codes shall conform to standard ICEA and TIA-598 conventions as follows:1-Blue, 2-Orange, 3-Green, 4-Brown, 5-Slate, 6-White, 7-Red, 9-Yellow, 10-Voilet, 12- Aqua.
- Optical fiber in any cable construction shall be enhanced performance, bend-insensitive type.
- Singlemode cables shall perform at minimum to the attenuation, bandwidth, and distance application parameters in the table below.



SAMPLE RISER–FIBER OPTIC CABLING
SCALE: NONE

Fiber Gigabit and 10 Gigabit Ethernet Application Chart					
Fiber Type	**Wavelength (nm)**	**Max Attenuation (dB/km)**	**Bandwidth (MHz●Km)**	**1 GbE Distance (m) @ 850/1300nm**	**10 GbE Distance (m) @ 1300nm**
SM 8.3 µm (OS2)	1310/1550	0.5/0.5	>25000	5000/-	10,000/40,000

- Optical fiber cables as supplied shall meet or exceed the applicable IEC 60793-1 qualification test requirements for optical, geometry, mechanical, and environmental parameters as specified, and tested in accordance with TIA/EIA-455.

b. PERFORMANCE REQUIREMENTS

- For installed fiber cables, all fiber strands shall pass insertion loss and return loss in accordance with test methods ANSI/TIA/EIA-526-14 for multimode cables.

- Installed fiber cables shall exceed all currently ratified bandwidth-distance-application performance parameters for IEEE 802.3ae (10 GbE) and for IEEE 802.3ba (40/100 GbE)

- Plenum cables shall be rated UL NFPA-262/UL910/CSA FT-6

c. Acceptable Manufacturers:

- Hubbell Premise Wiring or pre-approved equal. The Hubbell products listed in the table below comply with all requirements specified in this document

HUBBELL CATALOG NUMBER	Description
HFCD15012PS	Fiber Optic Cable – 12 Strand SM 8.3 µm (OS2), Plenum, Armored, yellow

- Or approved equal of: Panduit, Berk-Tek

d. Fiber Backbone Distribution cable: indoor, armored Installation Requirements

- Prior to cable deployment, backbone pathways (conduit, tray, raceway, wire basket, etc.) for cable routing shall be permanently installed in compliance with contract documents, and applicable codes and standards.

- Racks, cabinets or enclosures into which cables are to be routed shall be permanently installed in compliance with contract documents, and applicable codes and standards.

- Optical fiber cables shall be deployed using the proper pulling grip or apparatus attached to the exposed cable strength member. Contact the cable manufacturer regarding permissible methods for cable pulling. Never pull directly on the fiber strands of an optical fiber cable.

- Cables shall not exceed minimum bend radius limits or maximum pulling loads during or after installation. Avoid crushing or abrasion of the cable jacket during installation.

- Installed cables shall be fully supported and strain relieved from pulling on terminated connections. Apply wire ties loosely and avoid crushing or clamping cables with excessive force.

- All non-armored fiber optic riser cables are to be installed in plenum inner-duct. Fibers in innerduct or armored plenum riser serving as riser cables are to be installed according to the attached riser drawing. Contractor to size the inner-duct for each cable run. Multiple fiber optic cables can occupy an individual inner-duct when non-armored finer is not used.

S. PATCH CABLES

1. Patch cables should meet the minimum performance requirements specified for each system. This requirement specifically prohibits the use of flat, non-twisted (also known as "silver satin") cords for Data or local area network applications. However, "silver satin" patch cables are acceptable for use in telephone systems.

2. The contractor shall provide two Category 6 Patch Cords for each end of each standard outlet for horizontal LAN connectivity. The cords are to be of varying lengths based on the patch panel, electronics equipment, and work area configurations. The quantity and lengths are to be documented and agreed upon, and the owner or Project Manager is to sign for them upon acceptance. These cords are to be stored in the MDF or IDF room for which they are designated.

3. The contractor is to provide LC to SC single-mode Patch Cords for connectivity for ports or equipment served by the fiber patch panel. The cords are to be of varying lengths based on the patch panel and electronics equipment configurations. These cords are to be stored in the MDF or IDF room for which they are designated.

4. Fiber Patch Cords

    a. Fiber Patch Cord Requirements

    - Provide factory-made, LC to SC single-mode fiber cables in 1-Meter lengths for every fiber cable installed.

    - LC Optical fiber patch cords shall be constructed with aramid-reinforced PVC loose-jacket duplex cable, with optical fibers having a 900-micron PVC buffer coating diameter. Optical fiber used in 10 GbE patch cords shall be laser optimized 50 or OS2 singlemode, per ANSI/TIA/EIA-492AAAC, with no substitutes.

    - 50 micron core optical fiber within the patch cord cable shall be graded index type in accordance with ANSI/TIA/EIA-492AAAC, with the following specifications:

        a. Core diameter: 50 +/-3.0 microns, or 8.3 micron for singelmode

        b. Cladding diameter: 125 +/- 2.0 microns

        c. Core/cladding concentricity: less than 3.0 microns

        d. Core non-circularity: 6% maximum

        e. Proof test: 100 kpsi

        f. Effective modal bandwidth: 5700 MHz•km

        g. Coating diameter: 245 +/-15 microns

        h. Buffer diameter: 900 microns nominal

    - Connector terminations on each end of the fiber patch cord shall be heat-cured epoxy type with a machine polish, inspected 100% for polish quality and mated-pair insertion loss.

    - Epoxy volume within each connector shall be sufficient to properly surround and strain relieve the fiber and buffer layer at the buffer/fiber transition inside the connector body.

    - Optical fiber patch cords shall be supplied in a sealed plastic bag with dust caps installed on each end, with insertion loss test results included.

    - Optical fiber patch cords shall be available in standard lengths of 1, 2, 3, and 5 meters.

    - Optical fiber patch cords shall be manufactured with industry standard LC or LC

connector terminations on each end.

- Factory mounted connectors on each end of the patch cords shall comply with the applicable ANSI/TIA/EIA-604 Inter-mateability standard.
- Buffered fiber strands within the cable jacket shall be surrounded by aramid (Kevlar) material serving as a strength member.
- The aramid (Kevlar) strength member shall be mechanically secured at each connector to provide tensile strain relief of the optical fiber.
- Additional strain relief of the buffered fiber shall result from crimping the rear of the connector during termination.
- Duplex fiber patch cords shall be a zip-cord cable construction with jacket cross-section dimensions of 3.0 mm X 6.0 mm for LC style.
- Duplex fiber patch cords shall have reverse-pair polarity according to ANSI/TIA/EIA-568-B.3 and TIA/EIA-TSB-125.
- Cable jacket shall be marked with the cable manufacturer, UL Optical Fiber Non-Metallic Riser rating (Type OFNR) designation, lot number, and fiber core/cladding diameter designation.
- Fiber A-B polarity shall be clearly marked on each end of duplex patch cords.
- Optical fiber patch cord jacket color shall be aqua blue, specifically for 50 micron laser optimized singlemode fiber cables.
- Fiber patch cord connector materials shall be as follows:
  a. LC Ferrules: zirconium ceramic
  b. LC housings: injection molded thermoplastic
  c. Dust Cap: nylon or PVC
  d. Strain relief boot: UL94-V0 molded PVC
  e. Strain relief boot on all connectors shall be beige.
  f. LC connector outer housing shall be beige.

b. Fiber Patch Cord Performance Requirements

- 50 micron laser optimized and singlemode patch cords shall have a maximum mated-pair insertion loss of 0.60 dB per end, with a minimum return loss of –20 dB.
- Fiber patch cords shall exceed 10 Gigabit Ethernet performance requirements of

IEEE 802.3 standard.

- Fiber patch cords shall exceed the mechanical reliability requirements for tensile, flex, twist and impact as specified in ANSI/TIA/EIA-568-B.3, Annex 'A'.

- Fiber patch cords shall exceed the environmental reliability requirements for high/low temperature and humidity as specified in ANSI/TIA/EIA-568-B.3, Annex 'A'.

c. Acceptable Manufacturers:

- Hubbell Premise Wiring: The Hubbell products listed in the table below comply with all requirements specified in this document

HUBBELL CATALOG NUMBER	Description
DFPCLCSCSyySM	LC-SC Optical Fiber Patch cords, OS2-SM, yellow
(yy=length-1,2,3,5m)	

- Or approved equal of: Ortronics, Panduit, Systimax.

5. Category 6 Patch Cords: In new construction projects, the default cabling infrastructure shall be Category 6 unless specified otherwise.

a. Category 6 Patch Cord Requirements

- The contractor shall provide two Category 6 Patch Cords for each end of each standard outlet for horizontal LAN connectivity. The cords are to be of varying lengths based on the patch panel, electronics equipment, and work area configurations. The quantity and lengths are to be documented and agreed upon, and the owner or Project Manager is to sign for them upon acceptance. These cords are to be stored in the MDF or IDF room for which they are designated.

- Category 6 patch cords shall be constructed with a clear polycarbonate plug and boot having vertically staggered, trifurcated contacts, each having 50 micro-inches of gold plating.

- Plug dimensions and function shall comply with FCC 47, Part 68.5.

- Patch cords shall have a snag-less feature, integral to the strain relief boot on each end.

- Patch cords shall be constructed with category 6 patch cable, with 24 AWG 7/32 tinned copper stranded conductors, each insulated with polyethylene, and overall jacket with UL flame-retardant PVC.

- Patch cords shall be manufactured using a T568B wiring format, and shall function suitably for either T568A or T568B wiring schemes.
- Patch cords shall be available in the following colors: black, blue, gray, yellow, orange, red, green, white, and purple. Custom lengths and colors shall be available with a delivery lead- time quotation.
- Standard patch cord lengths shall range from1 ft. to 20 ft.
- Category 6 patch cords shall be backward compatible with existing Category 5 and 5e cabling systems for fit, form, and function.

b. Category 6 Patch Cords

- All transmission performance parameters shall be independently verified by a UL or ETL third party testing organization.
- Category 6 patch cords shall be channel performance balanced with Hubbell category 6 jacks, patch panels, and punch-down blocks.
- Category 6 patch cords shall meet or exceed Category 6 component transmission requirements for connecting hardware, as specified in ANSI/TIA/EIA-568-B.2-1 standard.
- The manufacturer shall provide Category 6 component compliance certificates from third party testing organization upon request.
- Patch cords shall be cUL and UL LISTED 1863.
- Patch cords shall exceed IEEE 802.3 DTE Power specification to 4 times the rated current limits with no degradation of performance or materials.
- Patch cords shall be third party verified, error-free Gigabit Ethernet performance to IEEE 802.3 standard.
- Jacks shall exceed 4 Gb/s data transmission capacity within the bandwidth of 1 – 250 MHz when configured in a 4-connector channel.
- Category 6 patch cords shall meet or exceed the 4-connector channel transmission performance requirements of Category 6, per ANSI/TIA/EIA-568-C.2 standard.
- The 4-connector channel test configuration shall utilize Category 6 patch panels, blocks, and jacks.

c. Acceptable Manufacturers:

- Hubbell Premise Wiring: The Hubbell products listed in the table below comply with all requirements specified in this document

HUBBELL	Description

CATALOG NUMBER	
HC6xx01	Category 6 Patch Cord, 1FT
HC6xx03	Category 6 Patch Cord, 3FT
HC6xx05	Category 6 Patch Cord, 5FT
HC6xx07	Category 6 Patch Cord, 7FT
HC6xx010	Category 6 Patch Cord, 10FT
HC6xx15	Category 6 Patch Cord, 15FT
HC6xx20	Category 6 Patch Cord, 20FT
HC6xx25	Category 6 Patch Cord, 25FT

xx = Cable Color. Replace xx with “W” for White, “BK” for Black, “B” for Blue, “GY” for Gray, “GN” for Green, “P” for Purple, “OR” for Orange, “R” for Red, “Y” for Yellow. Refer to project drawing for color applications.

- Or approved equal of: Ortronics, Panduit, Systimax.

T. FIRE STOP – PENETRAION SEALANT

1. Provide fire-resistant silicone foam fill to restore fire ratings to all wall, floor, or ceiling penetrations. Foam must be UL classified and meet NEC and local code.

2. All penetrations through fire-rated floors and walls shall be sealed to prevent the passage of smoke, fire, toxic gas, or water. The fire rating of the penetration seal shall be at least that of the floor or wall into which it is installed, so that the original fire rating of the floor or wall is maintained as required by Article 300-21 of the National Electric Code.

3. No flammable material may be used to line the chase of the hole in which the fire stop material is to be installed.

4. When damming materials are to be left in place after the seal is complete, then all such materials shall be non-flammable.

5. The sealant shall be poured into the hole after each cable has been spread to allow a minimum of ½" of foam to flow between them. No cables may be touching each other, because contact between cables could allow voids to form in the fire stop.

6. If plastic cartridges are used for smaller installations, the chemical components of the foam shall be pre- measured within the cartridges to ensure the proper ratios.

7. The sealant shall remain resilient and pliable to allow for the removal and/or addition of cable without the necessity of drilling holes. It shall adhere to itself perfectly to allow any and all repairs to be made with the same material. It shall allow for vibration, expansion, and/or

contraction of anything passing through the penetration without affecting the seal, or cracking, crumbling, and spalling.

8. When sealant is injected into a penetration, the foam shall expand to surround all the items within the penetration at that time and be fire resistant, maintaining the pass-minute rating. No heat shall be required to further expand the foam to block the passage of fire and smoke or water.

9. The foam sealant material shall have been subjected to fire exposure testing in accordance with standard time-temperature curve in the Standard, UL, ASTM E

10. 119, and NJPA 251. The foam fire-stop material shall also have been subjected to the hose stream test in accordance with UL 10B.

U. TESTING

1. General Test Procedures

   a. Before an application for final acceptance of the work will be considered, all tests stated within this section shall be satisfactorily completed. The communications work shall include miLCellaneous tasks, (e.g., removal of panel trims, junction, and pull box covers) deemed necessary to demonstrate compliance with the requirements of the Communications specifications, as well as cable and equipment manufacturers' recommended installation procedures.

   b. Upon completion of testing and problem resolution, all connections must be 100% error free: "Error free" is defined to mean the item meets all the manufacturers' specifications and recommendations as published in their latest manufacturing manuals for proper installation and testing. In addition, each item must conform with all other related industrial practices and standards, Building Trades, and Electrical and Communications Industry Standards and Practices.

   c. Upon successful completion of each item of testing, the Contractor shall issue in writing a certificate of compliance, along with the test results, to the Project Manager. All failed CAT-6 cables and/or Fiber strands shall be clearly labeled and identified as defective, with the type of defect (i.e. open ring side, grounded tip, short, excessive loss, etc.) identified.

   d. The Contractor will attempt to remedy any defective copper cable pair or Fiber cable strand and specify in the documentation the location of the problem as identified during the testing procedures. The Fiber trouble location and identification must be completed with an OTDR.

2. Copper Cable Test Procedures

   a. Contractor must complete cable system performance verifications on all copper and fiber cable as specified below and provide the test results to the owner or project manager. Category 6 – 6a cable must meet or exceed all manufacturer's and EIA/TIA standards for performance and installation. Fiber cable must also meet or exceed all manufacturer's and EIA/TIA standards for performance and installation.

b. All copper and fiber optic testing documentation is to be submitted on a CD, as well as 8.5” x 11” hard copies.

c. At a minimum, in addition to any other required testing, the Contractor shall conduct and report on the following tests of copper cabling after the installation is complete:

- MDF-to-IDF tests of all new riser pairs installed under this contract, to determine continuity, shorts, crossed pairs, correct pinning, and grounds.

- IDF (patch panels)–to-information outlet tests of all new cable pairs installed under this contract, to determine continuity, shorts, crossed pairs, correct pinning, and grounds.

- The coaxial cable is to be tested from the MDF Room to the IDF Room and from the IDF Room to the coax outlet. Contractor is to test for continuity, shorts, and grounds.

- The horizontal Category 6 cabling, installed from the IDF Room to the Information Outlet at the workstation, is to be manufacturer certified and warranted for Category 6 compliance. All manufacturers’ performance certificates and extended warranties are to be provided to the owner or project manager upon completion of the testing and manufacturer certification. Contractor is to present copies of certificates identifying the contractor as a current certified VAR for the selected cabling system and therefore, qualified to install a certified cable plant.

- All Category 6 cabling is to be tested end–to-end and documented for Category 6 compliance at all frequencies up to and including 250MHz for 6. Such testing is to comply with the procedures and standards outlined by the cable manufacturer and EIA/TIA TSB - 67 concerning testing of Category 6 cable plant.

- A certified Cat 6 testing system is to be used for such testing to insure that cable pairs are defect free. "Defect free" for the copper cable is defined as a copper pair not having any pair reversals, split pairs, shorts or opens. Test results shall be provided to the Owner or Project Manager within 2 days after testing or 5 days prior to the Owner connecting electronic equipment onto the cable network, whichever is sooner. The contractor must also provide testing summary reports of all category 6 cables including run numbers, and pass/fail results with respect to length, impedance, DC resistance, mutual capacitance, attenuation, NEXT loss, and active ACR. The contractor must also provide spreadsheet analysis of the linearly dependent parameters of length, DC resistance, mutual capacitance, and attenuation; the field measured values shall be compared to the specification’s values on one spreadsheet.

- In the event that a CAT 6 cable fails to perform to the manufacturer's specifications, the Contractor will, at the owner’s request, remove the cable and replace it with a new cable, replacing the defective cable at no additional expense to the owner.

- End-to-end testing is required for every RJ-45 connection. An owner's representative may accompany the Contractor’s staff to witness the end-to-end testing. End-to-end testing is defined herein as testing all cabling links to the very last termination point. The Contractor is required to supply sufficient quantities of two-way radios and test equipment to ensure that the tests are completed accurately and expeditiously.

- The Owner, DTI, or Project manager may conduct performance tests of transport electronics connected to the cabling system. Successful equipment performance tests do not relieve the Contractor from the specified testing, repair, and documentation requirements.

- The Contractor shall provide to the Owner or Project Manager with copies of all copper-cable test results.

3. Fiber Optic Cable Test Procedures

   a. All fiber optic cable and associated equipment lateral, and vertical riser cabling must be thoroughly tested. The fiber cable will be accepted only after each strand is tested in accordance with the specifications defined herein. All strands are to be tested and found to be 100% acceptable.

   b. The Contractor shall test all cables, connectors, associated equipment, and hardware furnished by the Contractor upon receipt of same as defined herein.

   c. As a minimum, the Contractor shall test, as described below, all optical fiber cable strands installed within the scope of this proposal:

      - Fully test complete links only. Piecemeal testing is not acceptable.

      - Perform end-to-end, bi-directional attenuation (loss) test for each fiber strand at 1310 and 1550 for singelmode. Conduct tests in accordance with EIA/TIA-526-14, Method B and with test instrument manufacturer's published instructions.

        a. Demonstrate that measured link loss does not exceed the expected value based on the number of mated connector pairs, the connector's published loss per mated pair, and the cable's published loss based on distance.

        b. Strands whose measured attenuation falls outside the acceptable range shall be subject to further inspection and testing to determine the nature of the fault. At a minimum, an OTDR shall be used to: determine the true loss for each connector pair and the exact length of the fiber, and to identify the presence of any core damage.

        c. Riser end-to-end testing of individual optical fibers is considered to be from the MDF Room to the IDF Rooms distribution panels on each floor.

      - Faults related to connectors shall be corrected and the fiber re-tested as stated above until acceptable attenuation measurements are received.

      - Where defects are found to be inherent in the fiber itself, notify the Project Manager in writing. Upon obtaining approval by the Project Manager, replace any cable having fewer than the manufacturer's guaranteed number of serviceable fibers.

      - Remove all newly installed defective cables from pathways. Do not abandon cables in place.

      - All test results and corrective procedures are to be documented and submitted as a

spreadsheet, and digitally on a USB thumb drive to State/DTI within five (5) working days of test completion.

- Considering that the fiber cable plant is to be certified, each test report form shall provide at least the following information:

  a. Project name

  b. Contractor's name

  c. Date(s) of preparation and of testing

  d. Fiber type, strand count, connectors and patches

  e. Designated cable number (regardless of whether only one cable of each type is present) and individual fiber numbers

  f. Make, model, serial number, and date of last calibration of test equipment used

  g. Name of test crew foreman

  h. Test results: Calculated maximum link loss, length of run, OTDR, and also

  i. Power Meter-measured link loss for each fiber, pass/fail result, and comments.

- In addition to the tests specified above, the Contractor shall be present while the Owner or Project Manager conducts performance tests of the transport electronics connected to the cabling system; the contractor shall conduct on- the-spot cable tests and effect cable plant repairs as necessary. Successful equipment performance tests do not relieve the Contractor from the specified testing, repair, and documentation requirements.

- Recommended test equipment:

  a. Optical fiber power meter and Light Source: OS-100D Light Source, or equivalent.

  b. TDR: Tektronix TFP2 FiberMaster, Laser Precision TD-2000 or equivalent with 850nm and 1300nm emitter modules and hard copy printout, or equivalent.

  c. Optical fiber inspection scope: Cambridge Instruments 10x fiber scope, or equivalent.

- The Contractor shall provide copies of all fiber and copper cable test results to the Owner or Project Manager.

- All fiber optic cabling (workstation and riser) is to be installed in a manner that complies with and allows Owner to receive the manufacturer’s extended warranty. The contractor is to be certified and authorized to provide the extended warranty. A manufacturer's extended warranty is to be provided, through the contractor, upon completion of the testing and manufacturer’s certification. Contractor is to present

copies of certificates identifying the contractor as a current certified VAR and therefore, qualified to certify and install the cable plant.

- The Owner and Project Manager reserves the right to observe any or all portions of the testing. Notification of testing is at least three days prior to start of testing.

4. Replacement

   a. Any fiber strand, connector, block, or module installed by the Contractor that fails to meet the loss budget, or that tests below the manufacturer's standards, shall be replaced at no additional cost to the owners or State/DTI. The replacement cable, connector, or part shall be tested after repairs have been made to verify compliance. Only equipment that meets the installation requirements stated herein shall meet the system’s acceptance requirements.

5. Source Manufacturing/Quality Control

   a. Cables that are supplied by the Contractor, and test outside of the factory test data by a margin of 10 percent on loss, may be deemed non-usable and returned to the manufacturer for replacement.

6. Physical Inspection: Prior to conducting any transmission testing, the following visual inspections will be performed:

   a. Verify that all cable has been installed in full compliance with the proposal specifications.

   b. Check for physical damage to the Fiber Distribution Panels and termination hardware.

   c. Check that all cabling is properly jacketed, installation properly labeled at both ends of the cable, inner-duct and termination hardware is completed in all IDFs and the MDF Room.

   d. Verify that all cable bends are within the manufacturer's specified bend radius.

   e. Verify that all cabinets and racks (which require grounding) are properly grounded and comply with the National and Local Electrical Codes and State Standards for grounding.

   f. Verify that the cables are properly approved and structurally supported for termination.

   g. Verify that all Delaware Fire Code requirements have been met and satisfied.

7. DOCUMENTATION

   a. Proper labeling and documentation will allow a technician to quickly trace a particular cable link and will significantly reduce the time and costs of moves, additions, changes, and troubleshooting. Both labeling and documentation depend on the use of a system-wide coding LCheme that will identify and locate each component of the wiring system and allow all components to be linked in a logical fashion.

   b. There are three components of wiring system documentation:

(1) Labeling Communications/Data room/closet termination areas aids in identifying the source and function of a circuit.

(2) A labeling scheme simplifies the documentation process.

(3) “As built” documents provide a permanent record of the communications infrastructure. These documents are a critical management resource. As a result, it is imperative that "as built" documentation be prepared as part of the communications infrastructure project. In addition, these documents must be kept current throughout the system's life cycle.

8. Termination Blocks

   a. Labels on the connecting hardware should be coded based on the function of the terminated wiring. Colored designation strips are typically provided with a termination block.

9. Cable and Information Outlet Identification: The Contractor shall furnish and install cable tags labeled with identifying cable numbers mutually agreed upon with contractor and the Owner or Project Manager.

   a. The Contractor shall clearly and consistently mark the appropriate designation strip labels on all termination hardware mutually agreed upon with the Owner or Project Manager. Contractor will submit a sample of all designation labels for approval before installation.

   b. The Contractor shall affix outlet identification labels, machine printed or typed, with identifying cable numbers as shown on the attached drawings.

   c. Subsequent to pulling and terminating cables, the Contractor shall place the appropriate cable tags within six (6) inches of each end of each copper cable and eighteen (18) inches of each optical fiber cable end.

   d. If the cable tape becomes illegible or is removed at any time during the job, the

   e. Contractor shall immediately replace it with a duplicate preprinted cable tag.

   f. The Contractor shall provide the Owner or Project Manager with a listing of all cable identification numbers, keyed to cable types.

   g. Contractor will label each information outlet with the following labeling scheme: If the 1st floor IDF closet “A” is the origination point of the cable feeding workstation “007” the following is the configuration of the label to be installed:

      Floor- IDF Closet - Information Outlet Number

      Example: 1A-007

   h. Contractor will submit for approval a sample of all information outlet designation labels.

10. “As-Built” Documentation

a. Maintaining records and documents is the most important portion of the administration of a communications infrastructure. Maintenance and moves, additions, and changes can become very difficult if a current set of records and documents is not maintained. In fact, isolation and resolution of problems are often delayed because configuration information is either unavailable or outdated.

b. Subsequent to the installation and prior to acceptance, the Contractor shall prepare and issue As-Built drawings, in an AutoCAD format, that shall reflect the lengths of cables installed and the actual manner and conditions of installation, including all deletions from, additions to, or departures from the contract documents. These documents are to include the information outlet station numbers and cable routing where they vary from the original plan. A copy of these documents will be stored in the MDF, with a master copy located at the Owner or Project Manager.

11. Cable Management System

a. Wiring and equipment relationships must be maintained in a database or spreadsheet (depending on their complexity). The best approach is to use a third- party vendor's application for tracking cable management. These records contain comprehensive information about the users' communications configuration. The information will be very valuable in the support of long-term user-community communications requirements.

V. APPENDIX A – COMMUNICATIONS PLANNING CHECKLIST

1. Space allocation for Communications/Data Room/Closets

a. Based on a number of factors, including the:

- Type of equipment to be installed
- Size of the phone and data termination backboards
- Access to floor cores and conduits
- Cable tray requirements
- Location, size, and swing of the Communications/Data room/closet door(s)

b. Square footage is not as important as the actual floor dimensions and the placement of the equipment. It is possible to design around some obstacles and still have a functional facility. For instance, an oblong room is not as desirable as a square room having the same square footage.

c. The criteria for establishing the size of a Communications/Data room/closet and determining whether or not it is functionally acceptable are complex. Answering the following questions is the first step in determining the long-term feasibility of a communications room or closet:

- What will be the closet’s primary function: phone, data, or combined services?
- Where is it located in proximity to serviced workstations, network rooms, and other

Communications/Data rooms/closets?

- What type of equipment is going to be in the room/closet?
- Is it wall- and/or rack-mounted?
- How much equipment will be put in the room/closet? What are the dimensions of those devices?
- What are their environment requirements?
- Based on the type(s) of equipment going into the room/closet, what is the installation, maintenance, and operator work space required around the equipment?
- Can the equipment be attached securely to the structure?
- What cable types are being used? What are the cable separation requirements? Where are the cables terminated within the closet?
- Does equipment mounted in the closet require an open space? Is there any other device needing clear space?
- Is the room/closet securable? Do other entities need access to the space? What are their space requirements?
- What size is the door? Does it swing in or out? Can the door be modified?
- Is power available? Can it support the room/closet electrical requirements? Can it be modified?
- Does the room need air conditioning? Does it ventilate well? Can it be modified?
- Where are the floor cores and the ceiling access points for conduits?
- Are there expansion requirements? Can the expansion requirements be accommodated by the room/closet size? Can the closed be enlarged at a later date?

W. APPENDIX B – CABLE INSTALLATION CHECKLIST

1. Check Local Building Codes

   The requirements stipulated by Section 800 of the National Electrical Code for Communications cable installations produce an orderly installation. However, it is important to consult your building inspector to determine whether there are special local requirements. Strapping requirements depend upon the building's design, State and Local Standards, and codes. Terminations can be made in standard junction boxes.

2. Coordinate with Other Contractors

   Plan to install the cabling system in new buildings after the power wiring, air- handling ducts, and ceiling supports have been installed, but before the ceiling tiles are in place. This will

prevent damage to the cable system during construction.

3. Plan the Job

   On a blueprint, mark all terminations and desired routings, if known, to accommodate future building modifications.

4. Label the Cables

   Label each cable reel and its free end according to the termination locations marked on your blueprint.

5. Pull Cable into Place

   Deliver the cable from the bottom of each reel, making sure not to kink, crush, or pinch the cable. Pull groups of cables to a logical point and then fan out to the individual termination points. Arrange the cables neatly so they are easily identifiable for relocation. Separate the Communications cables from other cables by at least six inches and avoid sharp edges, tight bends, and locations that would subject the cable to abrasion, corrosion, or moisture. According to the National Electrical Code, low-voltage cables cannot share a tray with power cables. Running signal cables close to power cables may also cause hum pickup. If in doubt about cable locations, consult the standards or the Owner.

6. Remove Slack

   Remove slack in lines by pulling the cables back to the wiring room and by adjusting their ceiling location as needed.

7. Label and Cut

   Label each cable and then cut it off, making sure to leave enough cable to reach the termination panel.

8. Tie Cables Together

   Use cable ties to bundle and secure parallel runs together. Place the ties at intervals sufficient to prevent sagging and to maintain neatness. Distances between ties may vary from six inches to four feet, depending on the size of the cables.

9. Strap the Cable

   Use straps to fasten the tied cable bundles to hangers at 4-foot or other appropriate intervals. The distance between hangers will vary from 3 to 20 feet, depending upon the strapping surface, the type and number of cables in each bundle, State and Local Standards, and codes. Make sure to support the cables with hangers rather than pipes, conduit, or other structures in the building plenum. If space permits, use existing hangers; otherwise, install new ones. Do not use straps that are too small for the cable diameter because they can cut or pinch the cable insulation.

10. Inspect the Job

    Be sure that the cables are not resting on false ceilings or near electrical fixtures or sagging more than three inches from the point of the tie wrap.

X. APPENDIX C – QUALTY ASSURANCE

1. All materials used shall bear the Underwriters' Laboratory, Inc. label, provided a standard has been established for the material in question.

2. All products and materials shall be new and unused, clean, and free of defects, damage, and corrosion.

Y. APPENDIX D – CODES, REGULATIONS, AND STANDARDS

1. All installations and equipment shall be in compliance with, equal to or exceed the minimum requirements of OSHA, NEC, NEMA, IEEE, SAME, ANSI, UL, EIA, TIA recommendations and the rules, regulations and requirements of the Federal Communications Commission.

2. The installation shall comply fully with all applicable Local, County and State of

3. Delaware laws and ordinances, regulations, and codes.

4. Local electrical and building codes in Delaware may be more restrictive than national codes, recommendations or practice. Follow the most restrictive code or recommendations.

5. Should any change in plans or Specifications be required to comply with governmental regulations, the Contractor shall notify the Owner or Project Manager at the time of submitting the construction schedule.

Z. APPENDIX E – WARRANTY

1. Besides the manufacturer’s extended warranty the Contractor shall submit a single Guarantee stating that all portions of the work are in accordance with Contract requirements and guaranteeing all work against faulty and improper material and workmanship, including work and materials of all subcontractors, manufacturers, suppliers, and sub trade specialists, for a period of twenty-five (25) years from date of final acceptance by the project manager, State/DTI, and Owner. Where guarantees or warranties for longer terms are provided, such longer terms shall apply. Within 24 hours after notification, the Contractor shall correct any deficiencies that occur during the guarantee period at no additional cost to Owner, all to the satisfaction of the Project Manager and or Owner.

2. When installed by a Certified Installer and used in a Structured Cable System, the manufacturer’s extended warranty shall cover the installation for a period of 25 years against defects in material and workmanship. It shall also guarantee that it will support any current and future applications designed for Data transmission over the 100/500MHz link/channel, as defined in TIA/EIA 568A Communications Standard.

3. All move, add and change (MAC) activity shall be covered by the warranty provided it is performed by a Certified Installer.

AA. APPENDIX F – BID/QUOTE RESPONSE FORMAT

1. Proposal identification number or control number. This number will be used as a reference for this individual proposal and will facilitate coordinating multiple bids or quotes for the same location or job site.

2. Requesting State Agency and Contact name, phone number and address. This should be the name of the State agency requesting the quote or bid and that agency's contact person's phone number(s) and address.

3. Building or office location address. This address should be the actual location of the job site. This address should include the floor numbers, if more than one story, and building numbers or names, if more than one building is involved.

4. Total Cost of Bid/Proposal. This dollar amount should include the total material and labor cost. The material and labor cost should be stated separately and then totaled. Also state whether or not labor costs are based on prevailing wage standards or not.

   Example:

Material	$3,500.00
Labor Prevailing	$2,750.00
Total	**$6,250.00**

5. Scope of Work. This section should be a written description of the work to be performed. It should be function-specific.

   Example:

   - Install, terminate both ends, test, and label XX work area locations consisting of one Voice and two Data CAT6 cables and CAT6 568-B RJ45 jacks.
   - Install one Voice cable from the Communications Closet to the Fir/Security Alarm Panel location.
   - Provide and install a 100-pair plenum-rated riser cable from the boiler room to the main communications closet and terminate on 110 type wall mount hardware.
   - Provide and install 7' relay racks and CAT6 patch panels.

6. Material

   The material should be and itemized list with manufacturer's name and part numbers, including all piece parts and quantity of each. Total man hours to complete the job should be included as an item in the list.

Hubbell Cable	Blue	C6RPB	2,800 ft

Hubbel Cable	White	C6RPW	2,000 ft
Hubbell Jack Single		HXJ6xx	14 ea
Hubbell Jack Double		HXJ6xx	14 ea
Hubbell 110 block		30200007	1 ea
Hubbell Panel P6E48U		951044344	1 ea
~~CIRCA protector panel~~		~~1880ECAS1-100G~~	~~2 ea~~
~~1 pair fuse CIRCA~~		~~4B1E~~	~~200 ea~~
etc.			
etc.			
etc.			
Labor Man Hours			75 hr

7. Warranty

   This should include the name of the manufacturer from which the State will receive the warranty and the type and length of the warranty or warranties provided with the cabling solution that is proposed. 25 years is required.

BB. APPENDIX H – CERTIFIED CONTRACTOR LIST

GSS16441-DATA_CBLV01 **Advantech Incorporated** 151 Garrison Oak Drive Dover, DE 19901 David Sweeney Phone: 302-674-8405 ext 123 Fax: 302-674-3698 Cell: 302-359-0189 Daves@advantechsecurity.net FSF ID#: 0000027017	GSS16441-DATA_CBLV02 **Arugie Enterprises Corp.** dba: ARG Communications 612 S Colonial Ave, Ste. A Wilmington, DE 19805 Joseph Ruggieri Phone: 302-225-2000 ext 301 Fax: 302-225-2010 Cell: 302-584-0010 joe@whyarg.com FSF ID#: 0000000456	GSS16441-DATA_CBLV03 **Assurance Medica, LLC** 590 Centruy Blvd., Suite B Wilmington, DE 19808 Chris Honeycutt Phone: 302-993-4486 Fax: 866-246-1153 Cell: 302-363-1500 choneycutt@assurancemedia.net FSF ID#: 0000020739

	GSS16441-DATA_CBLV05 **KCI Communications Infrastructure** 921 Mercantile Drive, Suite H Hannover, MD 21706 Josh Wilkerson Phone: 410-309-7902 ext 8614 josh.wilkerson@kci.com FSF ID#: 0000271910	GSS16441-DATA_CBLV06 **Skyline Technology Solutions, LLC** 6956-F Aviation Boulevard Glen Burnie, MD 21061 Jason Ross Phone: 410-590-2002 Fax: 410-787-2551 Cell: 443-398-7917 jross@skylinenet.net FSF ID#: 0000313842

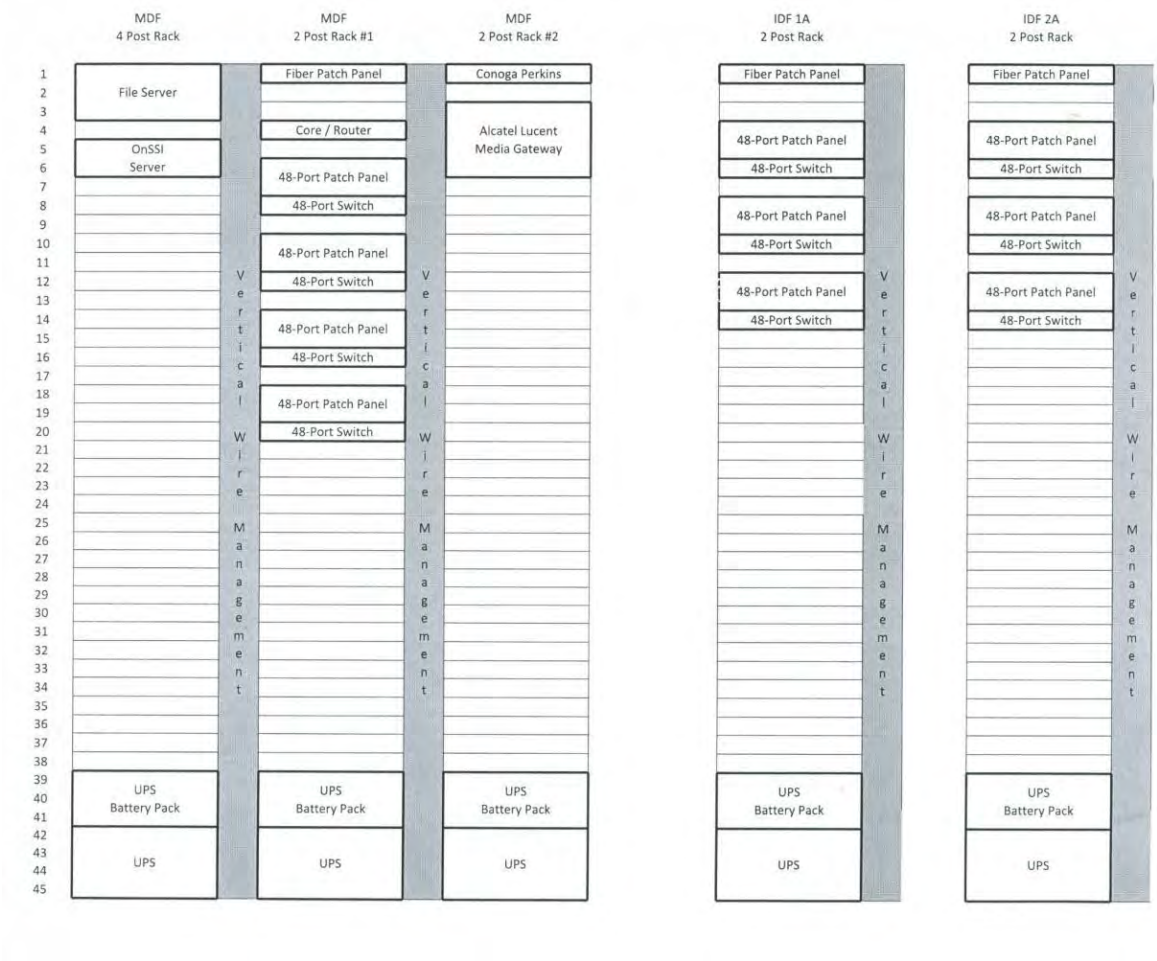
GSS16441-DATA_CBLV07 **Tangent Cable Systems, Inc.** 3700 Washington Avenue Wilmington, DE 19808 Chad Myers Phone: 302-994-4104 Fax: 302-994-4105 Cell: 302-463-2396 cmyers@tangentcable.com FSF ID#: 0000027967	GSS16441-DATA_CBLV08 **Troy Ventures, LLC** dba: ThinkSecureNet, LLC and SecureNetMD, LLC 16557 Coastal Highway Lewes, DE 19958 Andrew Laroche Phone: 302-645-7770 ext 800 Cell: 860-305-4787 drew@securenetmd.com FSF ID#: 0000317474, 0000261617, 0000453212	GSS16441-DATA_CBLV09 **Under.Comm, Inc.** 198 Mullet Run Milford, DE 19963 Scott Hermansader Phone: 302-424-1554 Fax: 302-424-4478 Cell: 302-222-236 scott@undercomm.com FSF ID#: 0000030544

Awarded Categories:

Vendor	General Structured Cabling	DTI Dark Finer
Advantech Incorporated	X	
ARG Communications	X	
Assurance Media	X	X
KCI Communications	X	
Skyline Technology Solutions	X	
Tangent Cable Systems	X	

Troy Ventures	X	
Under/Comm	X	

2.2 DISTRICT STANDARD RACK LAYOUTS



END OF SECTION